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CONTENTS

CONTRIBUTED ARTICLES PAGE

Dental and Oral Focal Infection—Its Significance to the Physician. M. A. Munblatt, D.D.S. . . . 215
An Efficient Method of Moving a Single Tooth to Close a Space, by One Treatment. Samuel Herder, D.D.S. . . . 224
Periodontia of Interest to the General Practitioner. Sidney Sorrin, D.D.S. 227
Profession or Trade? . . . 234
The Relation of Teeth to the Cycle of Life. W. S. Herrmann, D.D.S. 236
Dental Education: A Factor in Public Welfare. James Sullivan and William J. Gies, Ph.D., F.A.C.D. . . . 241
Award of Morris L. Chaim Prize for 1928 . . . 243
Paradental Pyorrhea and Alveolar Atrophy. Dr. Bernhard Gottlieb . 244
Oral Surgery in Practice. James L. Zemsky, D.D.S. . . . 246
Porcelain Manipulation. F. R. Felcher, D.D.S. . . . 252
Research in Oral Pathology . . . 256
To What Extent May American Achievements in Dentistry Be Applied to German Conditions? Dr. Hans Scherbel . . . 257
Death of Edwin S. Fuller, D.D.S. . . . 262
Resolutions On Death of Victor Hugo Jackson, M.A., M.D., D.D.S., F.A.C.D. . . . 262

FEATURES

DIGESTS . . . 264
PRACTICAL HINTS . . . 269
DENTAL ECONOMICS . . . 273
DENTAL SECRETARIES AND ASSISTANTS . . . 276
BOOKS RECEIVED . . . 280
EXTRACTIONS . . . 281
FUTURE EVENTS . . . 282

THE DENTAL DIGEST

George Wood Clapp, D.D.S., Editor

Allan M. Johnson, A.B., D.M.D., Associate Editor

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THE DENTAL DIGEST

VOLUME XXXV APRIL, 1929 NUMBER 4

Dental and Oral Focal Infection—Its Significance to the Physician

By M. A. MUNBLATT, D.D.S., Brooklyn, N. Y.

It is with considerable hesitation that the writer undertakes to prepare this paper, but, realizing the urgent necessity of an exposition on the significance of dental and oral focal infection to the physician, he finds himself duty bound to do so. We have gotten so far in the scientific development of the dental profession as to arouse the interest of our medical friends to such an extent that the latter are beginning to welcome eagerly our cooperation in the solution of their perplexing cases under treatment.

While it is to be admitted that very often we have gone to great excess in connecting dental and oral infection with systemic disease, there is no doubt that a great deal of benefit has been derived from the realization of such a connection. However, the time has now arrived when it becomes necessary to gather the various divergent opinions on the subject and put them to practical use, so that we can in this way apply our past experiences and the knowledge gained thereby in the solution of the individual problems that present themselves to both the dentist and the physician.

We must now begin to explain properly what we mean by septic dentistry, focal infection, and their connection with systemic disease. It also becomes most urgent that we properly understand what is the present consensus of opinion on dental and oral focal infection as well as the other connections between systemic conditions and dental and oral lesions. In other words, we must prepare ourselves for proper cooperation between dentist and physician by educating each in the field of their allied professions.

To begin with, in employing the term *focal infection* we must realize that we are referring to a common center, a focus or a central location of infection, from which toxins may escape to the general system and thereby spread the original infection throughout the body, lodging it in any place where it may be able to set up a localized attack. That source or focus may originate anywhere in the body. The tonsils, the appendix, the genital organs, the digestive tract, the lungs, the kidneys, the teeth or any part of the body may be the source, that is, may be a focus of infection.

Reviewing the modern literature on the question, we can readily see the realization of this phenomenon in the practical application by the various medical specialists in the solution of their individual problems while treating their cases. While it is understood that the source of infection may orig-

inate anywhere in the body, we have begun to be seriously impressed by the extent of dental and oral foci of infection. In the past the physician has confined himself to the various organic and systemic diseases and has accomplished much in the solution of their treatment. Progress has been made in the fields of diagnosis, treatment, etiology and prognosis, and many baffling conditions of the past are beginning to clarify themselves by the modern scientific development of the medical profession.

For example, let us mention the accomplishment in the treatment of various diseases—syphilis with its Wassermann test, diphtheria with its antitoxins, smallpox with its vaccinations, typhoid with its inoculations, rabies and even tuberculosis with their modern methods of treatment. We can mention many other progressive steps such as can be found in the discovery of insulin for diabetic treatment, x-ray and radium in cancer, etc. Endocrinology, dietetics and various other systemic complications have been previously overlooked as important etiologic as well as aggravating factors in the course of treatment. Dentistry is now considered as one of the important factors of etiology in various systemic diseases.

Rosenow, Billings and their coworkers, through extensive laboratory and clinical investigations carried on during the past few years, have demonstrated and proved the modern conception of focal infection and its connection with dental and oral sepsis. They have shown in their laboratory that streptococci which have been isolated from tissues in a great variety of diseases produce in a majority of cases, upon inoculation into rabbits, pathologic changes similar to those in the tissues from which the organisms were originally obtained. They have further demonstrated the fact that the predominating organism isolated from the focus of infection may produce, upon inoculation into animals, the same pathologic changes as the organism obtained from the diseased tissue, which derived its infection from the focus.

According to Rosenow, the following diseases may originate as metastatic infections from chronic foci of infection such as pyorrhea alveolaris and alveolar abscesses: rheumatic fever, acute and chronic infectious arthritis, myositis, bursitis, neuritis, iritis and other inflammatory diseases of the eye, including possibly neuroretinitis; vegetative endocarditis, ulcerative endocarditis, myocarditis, pericarditis, phlebitis, peritonitis, chorea, spinal meningitis, acute and chronic nephritis, acute and chronic appendicitis, colicystitis, gastric and duodenal ulcer, pancreatitis, thyroiditis, erythema nodosum, herpes zoster, osteomyelitis, periostitis, pneumonia, pleurisy, empyema, septicemia, erysipelas, cellulitis, lymphadenitis, etc. Proof of the practical application of these various findings in modern medicine needs very little effort for demonstration.

Many have applied these various theories of focal infection in their own practice with remarkable results. Enough case reports can be given to fill volumes, but no such attempt will be made to present them here. Suffice it to say, such a stage of understanding on the question of focal infection has

been reached between the dental and medical professions that it becomes incumbent upon us to encourage further cooperation between the members of these allied professions.

On the question of dental and oral focal infection many conclusions have been reached by our great medical authorities, and a good deal of material has been presented to awaken the interest of the dental profession to the responsibilities of its work. They have impressed the dental profession so much that remarkable changes are being inaugurated in the practice of dentistry, but as yet not enough effort has been exerted by the dentist in the proper presentation of his side of the problem in the process of its solution.

In other words, we know enough about dental and oral focal infection from a medical viewpoint but little from a dental viewpoint, and in order that further progress may be made it is most urgent that the dental angle be properly presented. The writer feels that because of the clinical experience, observation and experimentation which he has behind him, as well as the extensive study of the medical aspect which he has endeavored to master, he may be able to meet the responsibilities in presenting the viewpoint of the dental profession.

First of all, we must mention the fact that it has become popular at present to regard dental and oral conditions as a probable source or an aggravating factor in almost any disease that may baffle the physician. As a matter of fact, this idea is so popular that even the layman is impressed sufficiently to listen, and although in many instances he may become discouraged because of unsuccessful immediate results, he shows enough interest to accept the advice of his physician. The extent of benefit or harm that may have resulted from this attitude cannot be shown at present, but in the future a proper knowledge of the true part dental and oral conditions play in focal infection from a dental viewpoint is most necessary. Proper knowledge of dentistry and dental conditions as well as of the progress made in dentistry as a whole is most necessary for the physician. An effort will herewith be made to present this phase of the question.

A brief historical review of dental progress during the last two decades will now be attempted. The reason for presenting the developments of the dental profession during that period becomes apparent when the explanation is made that the most progressive steps of the profession were made during these few years. Technical improvements were rapid, the gold inlay was discovered and developed, the x-ray was properly applied in dentistry, Hunter made his great condemnation of septic dentistry, Rosenow and Mayo presented their remarkable discoveries and observations, and restorative and reparative measures were greatly improved in order to meet the required responsibilities.

When Hunter made his epoch-making statement about dentistry, little did he realize the decisive effect that it would have upon the immediate future of dental practice. The dental profession took his remarks to heart, especially when they were followed up by the statements and observations of Mayo and Rosenow. The old type of

shell crown, fixed bridgework and other reparative and restorative measures were abruptly attacked and improved. Root-canal therapy and the pulpless tooth received a great bombardment of criticism.

Our old methods of restorative measures were so severely condemned by both our dental and our medical leaders as to create remarkable improvements in technical procedures. The gold inlay and its modifications of three-quarter crowns, MacBoyle attachments and various others replaced gold-shell crowns as abutments for bridgework. Movable-removable bridgework and removable dentures were employed in many cases instead of the old fixed type of bridgework, and the style of pontics employed in any type of bridgework was greatly improved with the idea of removing the disadvantages of insanitation. Even to this day the dental profession is still imbued with the idea of technical improvements as the solution for septic dentistry.

However, it must not be forgotten that it was not the type nor the method of restoration that was at fault in the past or is so even at present, but the basic principles involved were the factors that were neglected and overlooked. Without the aid of the x-ray and with a lack of realization of the important significance of dental and oral disease as a systemic connection it can readily be seen that dental practice was more empirical than scientific. With the sane realization of our recent extremes a change is taking place at present in the attitude of the various dental leaders toward the critical viewpoints on the question of dental restoration and root-canal therapy.

It goes without saying that in order to treat diseased conditions properly it is necessary for us to understand and know the normal, and the most appropriate way of determining the normal is by the study of histology. The medical profession well realizes this fact and employs the microscope continuously in the practical application of medical science. However, not being interested directly in dental and oral conditions, the physician neglects the study of the histology of the teeth and mouth. The dental profession, on the other hand, because of its improper training in the past and also from a lack of realization of the biologic importance of its practice is in the majority of cases little interested in such highly theoretical studies.

The dentist so conducts his practice as to give the idea that he is wholly concerned with the local conditions of restoration and repair and not with the prevention and cure of dental and oral lesions. His patients are trained in the majority of cases to expect the sale of a commodity such as gold, amalgam or porcelain fillings or gold, rubber or aluminum dentures. It can readily be seen, then, why any progress in the study of dental and oral histology and pathology has been neglected by the average dental practitioner. But a change is imminent.

Pyorrhea

Pyorrhea may become a focus of infection, and to understand its action as such it becomes necessary to discuss that disease briefly. Pyorrhea, which literally means a discharge of pus, is the name given to a disease of the tissues surrounding the tooth. This dis-

ease has been known under numerous other names, such as pyorrhea alveolaris, periodontoclasia, etc. Its causes have been extensively discussed and the condition or degree of the disease varies considerably. It may present an inflammation of the gum without any other condition, or a flow of pus, an alveolar atrophy, loosening of the teeth, and various combinations. It has been considered by many that the causes of this disease are both local and systemic. Some investigators claim that the former may be the primary etiological factor, while others consider the latter a basic cause.

Traumatic occlusion is considered by many as the most important factor in pyorrhea (Stillman, McCall) while others maintain that the irritation from salivary calculus beneath the free margin of the gum is the main cause (Gottlieb, Orban). It can readily be seen that local factors play a prominent part in the causation of the disease, yet we must not neglect systemic complications that produce a lowered resistance and a resultant reaction favorable or unfavorable to the local irritation that may be present.

It has been the experience of the writer in his clinical observations to find that local irritations from salivary calculus play a prominent part in the etiology of pyorrhea, especially where there is an active flow of pus. On the other hand, he has found that traumatic occlusion creates a loosening of the tooth many times without pus formation, while at the same time, when there is an irritation to the gingiva from the salivary calculus, he finds also the complication of pus formation. Those clinicians who maintain that traumatic occlusion is the primary cause claim that they bring about results only when they relieve traumatic occlusion. Stillman and McCall have further so classified the disease under the name of periodontoclasia as to divide it into various stages, the purpose of which is to help them in their diagnosis and treatment.

On the other hand, Gottlieb and his school maintain that the irritation from salivary calculus beneath the free margin of the gum or gingival crevice is the only cause of pyorrhea, and that the disease of pyorrhea implies a flow of pus which can come only from the epithelium and not from the alveolar structure. According to them, an atrophy of the alveolus takes place as a result of the irritation upon the epithelium. Regardless of which of the two factors forms the primary local cause, the writer has found as a result of his clinical observations that, although either of the conditions (traumatic occlusion or salivary calculus) may be present, sometimes a pathological reaction does not result. He has further found that in many aggravating conditions of the disease a remarkable cure has resulted from a careful instrument manipulation in the removal of salivary calculus only, together with proper instruction to the patient on home care of the teeth, while in other cases he finds it necessary to correct traumatic occlusion before proper results can be obtained.

The greatest mistake made by the dental profession in general is to overlook the local and general reaction to local irritations on the part of the individual patient. In other words, in the conduct of its practice the dental pro-

fession severely overlooks the systemic complications that may be present, and in spite of the fact that we are dealing mainly with local factors we cannot forget that we are involved in a biological phenomenon with obscured natural factors. The sooner we appreciate the fact that we are facing individual characteristics as well as local manifestations and systemic factors, the sooner shall we be able to solve the problems that confront us. It can now be clearly realized that dentistry and medicine are closely allied, and that the problems of one affect the problems of the other.

The Pulpless Tooth

In the question of dental and oral focal infection we are facing a complicated problem that cannot be solved by the application of exact rules and principles. A filthy, neglected mouth with a prolific flow of pus and numerous granulomata at the apices of the teeth in one instance will have no effect on the general condition of the patient, while in another instance a dying pulp without any local symptoms and roentgenographically negative will be the etiologic factor of the most baffling disease of insanity, neuralgia, arthritis, or any of the other complications that Rosenow so ably proved in his laboratory.

Rosenow, Billings and many others claim that the devitalized tooth is a prolific factor in dental focal infection and severely condemn the operation of devitalization and root-canal therapy. They further maintain and prove that more dangerous conditions exist when there is no rarefied area manifested in the roentgenogram, advancing the theory that where there is a granuloma nature walls off the infection and thereby prevents its spread through metastasis.

On the other hand, we have many who oppose these views. Such men as Harlow Brooks, Hermann Prinz and others sound a note of warning against the excessive removal of infected teeth in the cure of a systemic disease without properly attempting other methods of approach. As a matter of fact, they seem to contend that many local infections may exist without one single general bad result. However, these contentions are only opinions that must be substantiated by clinical experimentation on the part of the dentist and the physician.

It has been the writer's experience in his practice of root-canal therapy to obtain most satisfactory results in his operations. If we only analyze the histological structures of the tissues involved, we can readily see that proper root-canal therapy is very possible without the creation of a focus of infection. Such men as Rhein, Ottolengui and Kells have devised technics, and to condemn their work without adequate appreciation of its possibilities is a grave mistake.

The dentist who sincerely attempts to retain devitalized teeth by practicing a proper technic in root-canal therapy does so today with a realization of the responsibilities involved because of the theory of focal infection. He has been forced to eliminate and narrow his cases. Those patients who are suffering from some systemic complication are classed as poor risks; the age and the general condition of the patient also must be taken into consideration.

The root-canal therapist further bases his technical procedures on a proper observation of asepsis and guides his work by a continuous and careful follow-up with roentgenograms. In other words, he considers that careful technic in his operation of root-canal therapy is of prime importance, and in order to satisfy the school that opposes root-canal therapy he limits his cases to healthy individuals only. There is one important factor that is overlooked in this work by both schools, whether they be dental or medical men. The local reaction of the structures involved from a histological and microscopically pathological viewpoint is entirely neglected.

To condemn root-canal therapy of the devitalized tooth on the broad statement that because of the theory of focal infection it might become a menace to the health of the individual is a dogmatic rule based on no sound scientific foundation. Furthermore, not only is the so-called non-vital tooth a possible menace to the health of the individual, but any tooth of the dental apparatus may at some time become the etiologic factor of some systemic disease.

According to the contentions of the "hundred percenters," it might be advisable to extract every tooth in order to prevent systemic complications, and this belief is just as wrong as the other. We overlook the fact that we are dealing with natural and biological processes, with vital tissues and cell activity, with metabolism, elimination and repair. If we carefully study the normal histology and microscopic pathology, we can readily see that there are forces at play that react either favorably or unfavorably in spite of the technical procedures of the operator. Tissue repair takes place in the tooth and its surrounding structures to the same extent as in any other part of the body, and the physiological and pathological processes of the entire system are factors that take a prominent part. We can only aid nature in her work, but we cannot force nature, regardless of how simple, complicated or exact our technic may be in any operation.

It was stated before that any tooth may at some time become the etiologic factor of some systemic disease. We shall not attempt to illustrate this contention. Besides caries there are many other sources of irritation to the tooth and the surrounding structures. A pulp may die or disintegrate as a result of trauma, thermal shock, or even some systemic disease, and sometimes no evidence will be manifested either roentgenographically or clinically. Irregularities of the teeth, food debris, salivary calculus, faulty fillings and bridgework may at some time become a local irritation and be the prime etiologic factor of caries or pyorrhea.

Very often clinical manifestations of the diseased condition will not be present locally and the patient will have no knowledge of the existing irritation, but, on the other hand, a facial neuralgia or any other systemic complication may aggravate the patient considerably as the result of the local irritation. We can then readily realize the complexity of the situation and the urgent need of a proper diagnosis in every individual case from a dental and medical viewpoint.

We must emphasize the fact that

every case is an individual problem, and that we are to apply the same reasoning to that problem as the physician attempts in the treatment of any disease. Infected areas at the root-apex of a tooth are by no means a healthy condition, and with the aid of the roentgenogram we are able in the majority of cases to locate the area of rarefaction, especially if it be of long standing. Root-canal therapy properly practiced can bring about a healthy reaction of the surrounding tissues, and there is no reason why any pulpless tooth cannot be brought back to as healthy a condition, subject to similar changes or possibilities of a future pathology, as any vital tooth in the dental apparatus.

Histological studies prove that there is a continuous physiological process and growth of the tooth regardless of whether we have a healthy pulp or a pulpless tooth. Pericementum does regenerate, we find, and alveolar bone likewise is reconstructed in the process of repair around a pulpless tooth as well as around one that contains a vital pulp.

We have found also that dentin grows continuously where the pulp is vital, and that when there is an outer irritation that is not too rapid, a deposition of dentin is laid down for the protection of the pulp. The reaction to stimuli from any source is either favorable or unfavorable according to the individual conditions, and the same applies to any method of therapy or treatment. In some instances large amalgam fillings receive a favorable response toward retention and the reconstruction of the tooth, while at other times a simple filling creates enough irritation to cause the death of the pulp and subsequent infection of the surrounding tissues regardless of the operator's skill and care.

The physician must realize, when looking for dental and oral foci of infections, that a mouth which contains a great deal of crown- and bridgework and other restorations may not harbor any septic dentistry, while, on the other hand, a normal denture and healthy-looking oral tissues may hide a prolific focus and be the etiologic factor involved. Realization on the part of the physician that a proper dental diagnosis is necessary in every condition that might be caused by some hidden focus of infection is of prime importance, and at the same time the reaction and the resistance of the patient must be taken into consideration before operative procedure is attempted.

We cannot overlook the fact that dental and oral surgery is very serious and very often requires as much preparation of the patient, precautionary measures, and postoperative care as any major operation. Evidence of the fact is abundantly proved in the serious complications and fatal results that often come from the innocent extraction of teeth. The theory of focal infection, if applicable in a certain case of dental sepsis, makes the operation for the removal of that condition a responsible and serious procedure. The proper cooperation between dentist and physician in that case is of paramount importance.

It must further be realized by the physician that there is a school of individuals in the dental profession who believe in the operation of pulpotomy or pulp amputation in cases where it is

indicated. The operation consists of cutting away under aseptic conditions the part of the pulp in the pulp chamber of the tooth and with proper antisepsis proceeding with the permanent filling of the tooth without further root-canal therapy or surgery. F. J. Bossard, of the University of Zurich, Switzerland, proves the success of this operation with histological and microscopical specimens, as well as by clinical evidence.

That this procedure is feasible can readily be shown in histological studies, but that diagnosis, selection of cases and surgical judgment from a medical and dental viewpoint are necessary needs most to be emphasized and become self-apparent. It can readily be seen, then, that the roentgenogram is only an aid in diagnosis and is not absolute in its manifestations. A case which may be roentgenographically negative may have local clinical symptoms of a very acute and serious infection or may be a primary focus without any local symptoms, while, on the other hand, a rarefied area in the roentgenogram may contain no infection and be the result of proper therapy and local reaction of tissues that are undergoing repair.

It is just as wrong for a medical practitioner to order the extraction of teeth without a proper realization of the complex conditions involved and the proper cooperation of a dental diagnosis as it is for a dentist to order some form of therapy from the physician without similar cooperation. There is a great necessity for clinical experimentation, charting of records and careful follow-up of cases involving dental and oral focal infection from both a medical and a dental viewpoint. That this work can be accomplished only in a hospital or an institution cannot be denied, and it is of the utmost importance for every hospital to have on its staff not only an oral surgeon but a broad-minded dentist who is well versed in dental and medical science.

Besides the installation in every Class A hospital of a well managed department of general dentistry, there is the most urgent need for many hospitals devoted to the specialty of dental and oral diseases. The sooner we realize the importance of dentistry as a specialty of medicine from a practical viewpoint, the better shall we be able to solve our many problems of infection.

CONCLUSIONS

We shall conclude this paper with the following general remarks:

(1) Although dentistry is involved mainly in local manifestations and treatments, it is a biological science and necessitates a medical background.

(2) Practical cooperation between dentist and physician is of the utmost importance in the solution of the problem of dental and oral focal infection.

(3) The necessity for the inauguration of a dental department in every Class A hospital cannot be denied.

(4) The establishment of hospitals for dental and oral diseases in every large city is of great importance for the purpose of clinical research and postgraduate training, as well as for offering the facilities of a properly equipped environment for serious cases of dental and oral surgery.

62 Hanson Place

An Efficient Method of Moving a Single Tooth to Close a Space, by One Treatment

By SAMUEL HERDER, D.D.S., New York, N. Y.

Chief of Orthodontia Department, The Union Health Center; Post-Graduate Instructor in Orthodontia, Allied Dental Council, New York

In the treatment of malocclusion, simply constructed and efficient appliances are in greatest demand. Not only are such appliances more effective in the hands of the capable orthodontist, but they also give the average dentist with orthodontic inclinations an opportunity to employ them with more satisfactory results. In the remarks which are to follow I shall describe a few such appliances which I have constructed for the purpose of moving individual teeth.

Figs. 1-3 show small appliances which are used in cases where the large molar-to-molar buccal or lingual arch wires are not employed.

In all of the illustrations the dotted

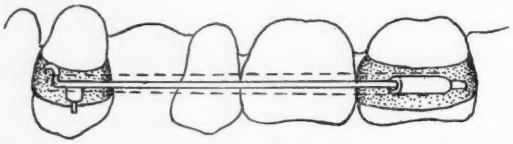


Fig. 1

A 20-gauge buccal round wire passing through the 19-gauge second molar buccal tube. The other end of the wire, which is curved upward to form a small hook, has a small vertical round 20-gauge pin soldered to it. This pin fits into the 19-gauge vertical tube soldered to the buccal surface of the cuspid. By placing a rubber band of suitable size over the molar tube and stretching it over the hook on the cuspid, a gentle, continuous force is produced upon the cuspid, gradually moving it distally through the space until it comes in contact with the second bicuspid.

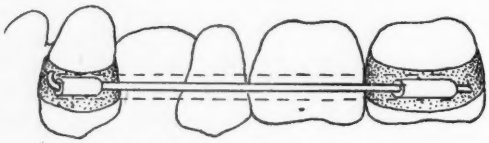


Fig. 2

This illustration is similar to Fig. 1, except that the cuspid tube is horizontal. The 20-gauge wire is passed through the 19-gauge tubes on the molar and cuspid, and the ends are bent to form short hooks, which prevent the wire from being pushed out of the tubes and permit the elastic rubber bands to be stretched over them. A force is applied to the cuspid similar to that in Fig. 1. It is a simpler appliance than the one in Fig. 1.

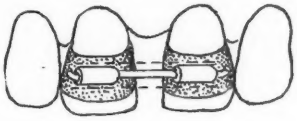


Fig. 3

An appliance similar to that in Fig. 2. Since the tubes are attached to the centrals, there is approximately an equal amount of force applied to each central by the rubber band which is stretched over the end of the tubes. In cases where the space is small, silk or wire ligature may be used instead of rubber bands.

lines represent the rubber bands passing over the tubes.

As indicated by the title of this paper, the operator need apply but one treatment. In cases where the tooth has not been completely moved to the place desired by one treatment, the patient is instructed to replace a torn or overstretched rubber band with a fresh one.

Figs. 4-5 show appliances which are used in cases where the molar-to-molar buccal arch wires are employed.

For the sake of clarity the incisor

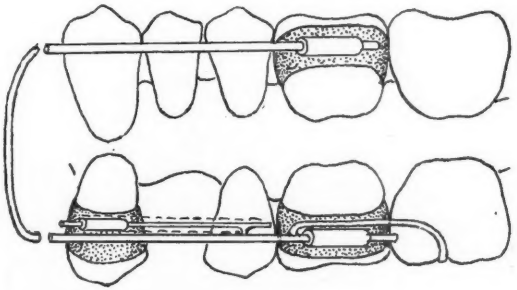


Fig. 4

An appliance used in connection with the ordinary round buccal arch wire. An auxiliary wire of smaller gauge than that of the main labial wire is soldered to it, parallel to the main labial wire. This smaller-gauge wire passes through the horizontal tube on the cuspid. A small rubber band stretched over the tube on the cuspid to the small, extended end of the auxiliary wire will gradually force the cuspid distally through the space. An auxiliary wire lug soldered to the main labial wire and so bent as to engage the central fossa or other suitable part of the second molar will reinforce the anchorage in the molar region.

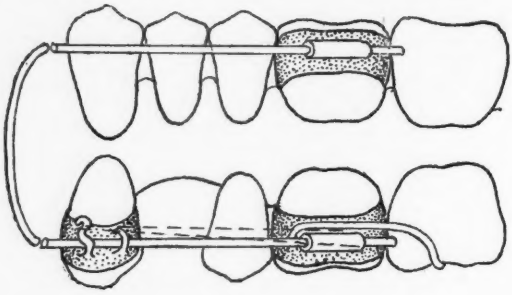


Fig. 5

An ordinary labial arch wire with the lug on the second molar, as shown in Fig. 4. Two round short brackets are soldered to the cuspid band. They are bent away from the cuspid sufficiently to permit the main labial wire to pass under them easily. One of these brackets may be extended to form a hook for engaging the rubber band. After the labial wire is placed into proper position in the buccal tubes and under the brackets attached to the cuspid, the rubber band may be applied over the end of the molar tube to the cuspid hook. The pressure produced on the cuspid will gradually move it distally through the space into contact with the second bicuspid.

133 West 72nd Street

teeth were not sketched in the illustrations shown in Figs. 4 and 5.

By the employment of the appliances here described, a bodily movement of the tooth is secured with a very satisfactory physiological reaction to the tissues.

133 West 72nd Street

Periodontia of Interest to the General Practitioner*

By SIDNEY SORRIN, D.D.S., New York, N. Y.
Chief, Periodontia Clinic, New York University College of Dentistry

It is an acknowledged fact that modern methods for the treatment of periodontal disease have proved to be successful. The splendid results attained can be traced in large part to the progress made in the linking up of etiology and treatment. The recent work of Box, Stillman, McCall, Gottlieb, and others in the profession, has not only aided in solving various problems in periodontoclasia, but has also enlightened the path toward the science of the prevention of dental disease. In the Periodontia Clinic of the New York University College of Dentistry we have stressed prevention of dental disease as a most important factor.

What greater satisfaction can be derived than the realization that we can prevent an initial lesion in preference to caring for a more advanced case? Dental problems that have baffled many in the profession in the past, are under control, in a fair way, today. Especially is this true of the science of periodontoclasia when its diagnosis, etiology and treatment are fully understood. Not only has the research work accomplished by our scientists enabled us to recognize predispositions to and incipient lesions of periodontal disease, but their contributions have taught us how to link up etiology and treatment.

In order to treat this condition properly, it is necessary to acquire a knowledge of the fundamental principles involved. An analogy may be drawn between a camera supported on a tripod and periodontal disease. We know that in order to obtain excellent pictures it is necessary first to balance the camera properly, and this depends upon the stability of the tripod. Each leg is adjusted to give the camera support. The treatment of periodontal disease may be compared to the camera in its dependence upon a tripod of three factors: (1) the removal of all factors which cause lowered resistance, (2) an understanding and application of the principles of scientific instrumentation, and (3) tissue resistance. Without the combined influence of these factors the treatment, in the long run, is doomed to failure.

The building up of tissue resistance may be accomplished by the proper application of toothbrush "physical culture of the gums"; the removal of effects such as tartar, suppuration, etc., is made possible by the scientific use of instruments; the eradication of the etiological factors may be accomplished by careful and painstaking efforts on the part of the operator. On this last subject I shall speak at length.

In the course of the last few years many students of periodontology have supported the theory that in the greatest percentage of cases local disturbances are the outstanding factors of periodontal disease. Only recently has the profession taken up the study of

* Delivered before the Eastern Dental Society of Philadelphia, Philadelphia, Pa., December 20, 1928.

traumatic occlusion as one of the most important considerations in all dental restorations. During the last five years over four thousand patients have been treated in our Periodontia Clinic, and careful observation indicates that traumatic occlusion plays a most important part in the production of periodontal disease. Figuratively speaking, this etiological factor has been found dominant in 85% of the cases treated in the Clinic. In view of this fact, it has become necessary to teach its correction in considerable detail.

In his latest work entitled *Treatment of the Periodontal Pocket* Harold K. Box, Research Professor of Periodontia at Toronto University, has the following to say about traumatic occlusion:

"Treatment of the pocket is preceded also by the establishment of physiological occlusion as far as this is possible. Relief from pericemental overstress produced by traumatic occlusion is the first fundamental requisite in the treatment of complex periodontitis and for the following reasons:

"(1) Physiological occlusion insures that the periodontal structures receive their normal functional stimuli and, when natural, is associated, as a rule, with normal mobility of the tooth in its alveolus. The periodontal tissues then tend to have a good circulation, adequate nourishment and prompt removal of waste products. They are allowed to remain in a healthy and quiescent state, wherein they are able to resist harmful influences of various kinds which bring about pathological changes in them. Acquired physiological occlusion and relief from pericemental overstress is followed, as a rule, by a marked increase in firmness of the tooth in its socket. With this tightening process the tissues are much less readily invaded by bacteria. This increase in tissue-resistance is shown in a marked degree in the process of pyogenic infection, where the amount of pus exuding from the pocket is usually decreased to a noticeable degree in three or four days. It follows, therefore, and is borne out in practice that treatment of a pocket on a tooth of normal mobility, or one rapidly approaching it, is much less subject to the complication of secondary infection than when carried out on a tooth of marked mobility.

"(2) Mobility interferes with the healing process through the agency of which reattachment of the soft tissues with the tooth takes place. It is obvious that when reattachment is the aim of the operator, it is of first importance that the tissues operated upon will have the most favorable condition possible for repair.

"(3) Experience has shown that when readjustment of the occlusal relations has been completed prior to scaling and curettement, with a period of rest intervening, the tissues tend to bleed less freely during these operations. As the success of these procedures depends largely upon the sense of touch and a knowledge of the anatomy of the parts, this is a matter of minor importance. However, it points to the important fact that hyperemia of the tissues is greatly reduced.

"(4) Further, it is common knowledge among periodontists that when scaling and curettement are carried out after occlusal readjustment, the attendant pain or discomfort is, as a rule, greatly diminished. This is true for

both dental and periodontal walls of the pocket. Equally important is the clinical fact that the length of the period of after-soreness is greatly decreased. It has been the observation of the writer that in general this period is approximately one-third of the corresponding period of after-soreness when instrumentation has been proceeded with before the occlusal equilibration.

"It is possible that prosthetic restorations are indicated at this stage of treatment-management as an important measure in the establishment of physiological occlusion.

"In regard to occlusal equilibration it may be of interest to quote an early authority in England. In 1821 Eleazar Parmly,* published *An Essay on the Disorders and Treatment of the Teeth,* in which he states, in the part dealing with periodontal disease, that 'the only assistance to be expected from the dentist is the removal of all impurities from their surfaces and the lessening as much as possible of the pressure of the upper and under teeth against each other.' "

Before going into detail as to treatment, it is necessary to become acquainted with some of the terms which are used. *Traumatic occlusion*** may be considered as a functional incoordination of the teeth and relates wholly to a mechanical disharmony. It produces stress in excess of what a given tooth is physically able to withstand. The pathological reaction which follows, that is, trauma, is not traumatic occlusion. This injury we speak of as *occlusal trauma.* This is a biologic reaction to stress, a reaction to injury, and it is clinically expressed as a pathologic effect. Traumatic occlusion relates wholly to the occlusion, while occlusal trauma relates only to the injury. Traumatic occlusion may be observed either in centric occlusion—the relation of the inclined planes of the teeth when the jaws are closed in the position of rest—or in eccentric occlusion—the relation of the inclined planes of the teeth when the jaws are closed in any of the excursive movements of the mandible. The closing of the jaws, whether in the act of mastication or in the act of bringing the upper and lower teeth into contact, results in the application of a varying degree of occlusal force to the teeth. The extent of normal occlusal force varies with each individual tooth according to its function, and each tooth in the normal jaw is provided with alveolar support sufficient to withstand the stress that is normal for that tooth. Normal occlusal force may be defined as the innocuous distribution of the stress or stresses exerted upon the teeth in their various contact relationships.

Previous to determining treatment we must make thorough investigation of all etiological factors. The first step necessitates accurate charting, noting both local and general conditions. The record chart used at the New York University College of Dentistry has been most helpful. This is followed by x-ray series of the mouth by the sixteen-film procedure, which enables one to procure two angles of

* Eleazar Parmly was President of the Board of Trustees, New York College of Dentistry, from 1866 to 1869.

** Stillman, *Dental Items of Interest,* February, 1927.

every tooth. Plaster casts of the upper and lower jaws are taken next. Photographs of the patient will be of great assistance in keeping a record of the progress of the case. Observe occlusion, length of cusps, and color of the gingivae. After all these conditions have been noted, a logical diagnosis and prognosis can be determined. If we have decided that traumatic occlusion is the etiological factor in this particular case, we must then ascertain by which means we may best accomplish results, that is, whether orthodontia, restorations, grinding, or combinations of these, would be advisable.

Our method decided upon, we proceed to balance the occlusion. Treatment consists of bringing about a harmonious relationship between the inclined planes of the cusps of the occluding teeth in centric, lateral and protrusive occlusion. This is achieved by reshaping the cusps or deepening the sulci by grinding when they interfere with a balanced lateral and protrusive movement, or when they strike too hard in centric occlusion. At this stage it is essential to be certain that through grinding the desired result will be attained without too much loss of enamel. It might be wiser at times to advise restorations. We establish balance by procuring protrusive balance, securing relief in centric occlusion, and establishing occlusal equilibration in lateral movements of the jaw.

Treatment*

Protrusive Balance

The first position of protrusive balance involves several outstanding factors:

(1) A study of the esthetic.
(2) The observance of the number of anterior teeth which occlude in this position.
(3) The interference of the cusps of the bicuspids and molars while gaining protrusive position.
(4) The relationship of overbite and overjet of anterior teeth to the inclined planes of the posterior teeth.

We must have in mind the esthetic at all times during the relief of traumatic occlusion. Whether the teeth to be ground are anteriors or posteriors, the form must be retained. In other words, after the completion of the grinding the shape of the teeth should not appear deformed.

With this thought before us, the patient is asked to bring the mandible forward in incisal occlusion. Note how many anteriors occlude in this position. We should try to establish contact of all the anteriors, if possible. Here, again, the esthetic comes into prominence. We begin to true up the upper anteriors by grinding the incisal line of the upper incisors, and sometimes the cuspids, to as nearly perfect an esthetic appearance as possible. It seems easier to operate on a straight line than to work on planes of individual teeth. When grinding, it is advisable to use a No. 5 stone. The patient is then instructed to bite on articulating paper to mark the incisal edges of the lower anteriors. The lowers are relieved with a No. 5 stone until the contact anteriorly is uniform.

* *Practice of Periodontia,* Sorrin and Miller.

It is not always necessary to grind. Should the patient in this position have no displacement of the teeth, no interference of cusps of bicuspids and molars previous to procuring tip-to-tip relation, and possess posterior contact, nothing need be done. However, we are constantly met with other conditions. If the posteriors do not meet in this position (three-point contact), then it becomes necessary to relieve the strain on the anterior teeth by further grinding until molar support is procured. Here we must determine whether grinding is more advisable than building up posteriorly. We are governed by the amount of tooth structure which would have to be removed to accomplish the desired result.

Now the patient is asked to glide the mandible in a forward-and-backward movement. We must be careful to observe two possibilities:

(1) Whether some of the cusps of the bicuspids or molars are brought into interference in this movement. The interfering cusps usually are those that have not been worn and are on teeth that have tipped either buccally or lingually until one cusp or another has been raised out of position. The teeth are located and the cusps are ground until there is no jarring nor tripping of the cusps in this forward-and-backward movement.

(2) Whether there is displacement of the anterior teeth in their sockets during this movement of the mandible. If this exists, the angle of inclination must be changed. This is accomplished by grinding the lingual surfaces of the upper anteriors or beveling the labial surfaces of the lowers, or both, thus increasing the overjet. This brings the terms *overjet* and *overbite* into consideration. By overbite is meant the vertical distance between the incisal edges of the upper and lower anterior teeth in the rest position. The overjet is the horizontal distance between the lingual of upper anteriors and the labial of lower anteriors.

"We must bear in mind that in considering traumatic occlusion of the anterior teeth we are dealing with the gliding of labial surface against lingual instead of cusp against cusp. These surfaces, however, present inclinations which have or should have essentially the same relationships as the cusp surfaces of the posterior teeth. If these inclined planes are out of mechanical harmony with the posterior inclined planes, or with each other, excessive lateral stress will be developed and tissue disturbances follow."*

CENTRIC OCCLUSION

If relief in protrusive position is properly planned, centric occlusion is completed, as far as the anteriors are concerned. There should be no actual displacement of the anteriors in this position. However, an added strain may be felt by the patient on the posterior teeth. The excess pressure will be noticed and the patient will be able to locate the exact tooth. Thick carbon paper will aid in determining these high spots, the points of heaviest marking being noted and then ground until there is no movement in the socket of any tooth and the patient feels comfortable. The pressure will feel equalized over the entire mouth.

* Stillman and McCall, *Dental Items of Interest*, April, 1927.

Lateral Movement

The relief in this movement of the jaw is procured in much the same manner as relief in other positions. Here again the tip of the index finger of the left hand is placed upon the crowns of the bicuspids and molars, and the patient is instructed first to close the jaws in centric occlusion and then to oscillate the mandible. If during this lateral movement it should be found that a tooth moves in its socket beyond what is considered normal, the presence of occlusal trauma may be considered established. The teeth can now be ascertained, the articulating paper acting as a guide. The surfaces of the teeth causing this undue pressure are relieved until they no longer interfere with the lateral movement. Teeth should glide over each other as do the blades of shears during the act of cutting.

The balancing sides also must be taken into consideration when this movement is planned. The balance in the lateral movements of the jaw should, when completed, give a normal contact on the working sides and balanced occlusion on the balancing sides. Tripping by the cusps in the oscillating movements of the jaw has caused good bridgework to loosen. This excessive pressure has produced mobility in otherwise healthy teeth.

When harmony in these movements has been obtained and the minimum of tooth displacement has resulted, the balance of occlusion may be considered established.

Suggestions

(1) The teeth should be polished with smooth cuttle-fish discs after grinding.

(2) When palpating for displacement of teeth, use the index finger of the left hand. It seems to be more sensitive than the right.

(3) To remove additional high spots or rough surfaces after grinding, incorporate carborundum paste into softened chewing gum.

(4) Even though only one or two teeth may be affected, there is the possibility that others should be relieved to accomplish the desired result.

(5) At times patients are unable to move the mandible laterally. This is usually a result of an abnormal overbite or close interlocking of cusps.

(6) Remember that all suggestions given for the relief of traumatic occlusion are not followed in every case. Sometimes there are too many factors which will interfere with the attainment of the ideal. Common sense should always be the guide.

(7). Be certain that patients feel comfortable after each treatment.

(8) In the course of the relief of one side during lateral movement, observe that the cusps of the other side are free from interference to the proper movement.

(9) Where form of tooth or density of tooth structure or an artificial substitute does not allow for grinding, use the opposing tooth. If the offending member is grossly out of harmony, it may be necessary to extract or, in the case of a restoration, to replace it.

(10) Do not heat the stone; cool it by spraying with water.

(11) While grinding, do not keep the stone on one spot for any length of time.

(12) At all times restore the tooth form.

(13) If a sensitive spot or so-called erosion cavity is encountered, dry 40% formalin or a saturated solution of potassium carbonate in glycerine into the area.

(*a*) Dry the tooth well and apply formalin to the area on a small pellet of cotton.

(*b*) Apply hot air to the area and the sensitive spot will be relieved. Another method can be used. The formalin can be rubbed into the area by heating an orange-wood point immersed in formalin over a flame and rubbing it into the sensitive location.

(14) If crowns or bridges interfere with procuring a balance, they should be removed and new ones placed.

(15) By all means be certain that your diagnosis and prognosis are correct before commencing to grind.

269 West 72nd Street

[ONE-PIECE CASTINGS]

The advantages of the all-gold one-piece casting are many, among them being simplicity of construction, greater ease and accuracy in fitting, saving of time, greater variation of design, freedom from soldered joints, need of but one sitting for impression and one for installation, direct casting to the model and the securing of a replica of the mouth conditions in a hard refractory investment compound, which enables the dentist or technician to make accurate survey and thereby predetermine installation and service and maintenance problems, and to simplify the designing of the appliance.

—ROACH.

Profession or Trade?*

An old and highly respected dentist in a distant city made the following remark to the writer some two years ago: "I entered dentistry when it was a trade with professional ideals. I have lived to see it become a profession with trade ideals." We have never forgotten those words. How succinctly and forcefully our elderly friend expressed a growing trend which is patent to all. Those gentlemen of the old school did hand something down to dentistry in addition to skill in manipulating gold foil and which we are in danger of losing in this highly commercial age. No man who ever sat under "Daddy" Taft in the old dental college at Ann Arbor will ever forget the high professional ideals that were a part of his whole being. A large group of his contemporaries could also be quoted in this connection.

Now we grant that more than ideals is necessary to practice dentistry successfully, and undoubtedly there has been lacking in dental education some fundamental business training very much needed and which many have had to acquire through hard knocks and bitter experience. There is, however, no conflict between high professional ideals and good sound business judgment and conduct. A man owes it to himself and his family to learn those principles and practice them, and he ought to get more of these in college. However, this was not at all the tendency which was deplored. It is the trend toward a commercialism which suppresses or ignores professional ideals. There is a certain type of commercialism which is rampant today, and which is the very antithesis of professionalism, and that tendency must be opposed or the profession will suffer profoundly. Dental service to individuals or the public can never be put in the same category as selling silk stockings or cigarettes. At least, if that time comes there is no profession left.

This tendency is seen in the effort to exploit some material or method for the benefit of the promoter and not the profession or the patient, as is in evidence in circulars, dental magazines and also at many dental meetings. As I write, there is a letter before me just received and similar to many others that come to a state secretary. It is from a distant state and is on the stationery of a man who calls himself a "dental surgeon," and to emphasize this he even prefixes the title "Dr." to his signature. It says: "I wish to secure the names of all the dentists in the State of Michigan. If it is not asking too much, will you please send them to me." I consider it is asking too much, especially as no stamps are enclosed and no mention is made of the use he wishes to make of such a list. Probably it is to circularize the profession concerning something he has to sell.

That others are thinking along these same lines is evidenced by a recent editorial in the *Bulletin of the Missouri State Dental Association* by President O. B. Coleman of that society, from which we quote:

* Editorial reprinted by permission from the *Michigan State Dental Society Bulletin*, February, 1929.

"Are we professional men or are we tradesmen? If one but takes heed of the general trend of conversation and scrutinizes in an analytical manner many of the papers presented at our dental meetings, the truly altruistic phase of our calling will shrink to a very marked degree. From time immemorial there has been a sharp line of demarcation between the man engaged in commercial pursuits and the man following a profession. Of recent years, however, this line has been less definitely marked, and if the present trend continues we will soon be in the merchandizing business. We have a number of research organizations doing an inestimable service, which are at our command, yet the rank and file of our profession will not take the time necessary to familiarize themselves with these reports, but let some spectacular clinician appear on the program of our meetings with something which may in a few months prove impractical and unscientific, and at once the sections considering more meritorious problems will be deserted.

"If we are to retain our position, attained as a result of years of effort on the part of those who have sacrificed in order to serve, we must right about face and recognize the responsibility imposed upon us by our Alma Mater. The old family doctor passed out with the eighteenth century and unfortunately his passing left an unfilled gap. His knowledge of materia medica and therapeutics may have been somewhat limited, yet his familiarity with psychotherapy would put many so-called specialists to shame.

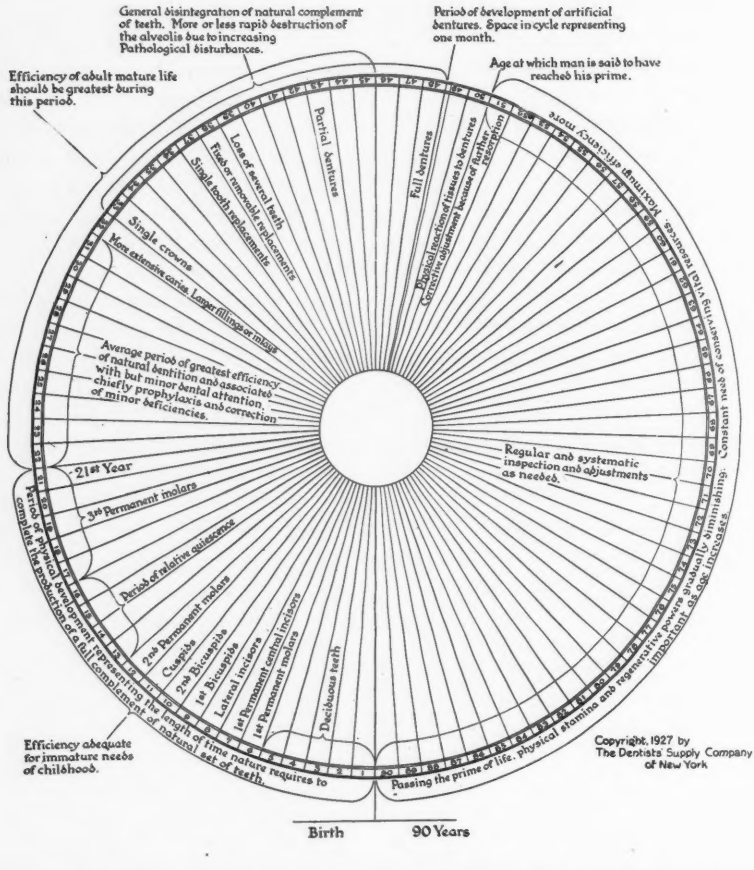
"Quantity production with reduced cost per unit is not now restricted to the manufacturing business, but is to be found in the modern dental office as well. When the voice of protest is raised, we are at once met with the rejoinder that we are conducting a business and only business rules apply. The welcome handshake, the cheerful smile, the sympathetic ear are in danger of becoming a lost art so far as the practice of dentistry is concerned."

The Relation of Teeth to the Cycle of Life

By W. S. HEERMANS, D.D.S., New York, N. Y.

The accompanying chart was conceived and designed to assist one to concentrate thought upon the relation of teeth to the cycle of life and thus acquire a suitable mental picture of the significance of teeth as related to their development and purpose and of the factors having a bearing upon their serviceability, preservation and eventual disintegration. Its value lies in the ability of the dentist, with its assistance, to convey to the laity a true

THE RELATION OF TEETH TO THE CYCLE OF LIFE


General disintegration of natural complement of teeth. More or less rapid destruction of the alveolis due to increasing Pathological disturbances.
Period of development of artificial dentures. Space in cycle representing one month.
Age at which man is said to have reached his prime.
Efficiency of adult mature life should be greatest during this period.
Partial dentures
Full dentures
Physical reaction of tissues to dentures. Corrective adjustment becomes further absorption
Loss of several teeth
Fixed or removable replacements
Single tooth replacements
Single crowns
More extensive caries. Larger fillings or inlays
Average period of greatest efficiency of natural dentition and associated with but minor dental attention chiefly prophylaxis and correction of minor deficiencies.
21st Year
3rd Permanent molars
Period of relative quiescence
2nd Permanent molars
Cuspids
2nd Bicuspids
1st Bicuspids
Lateral incisors
1st Permanent central incisors
1st Permanent molars
Deciduous teeth
Regular and systematic inspection and adjustments as needed.
Constant need of conserving vital resources. Maximum efficiency more important as age increases
Period of physical development representing the length of time nature requires to complete the production of a full complement of natural set of teeth
Efficiency adequate for immature needs of childhood.
Passing the prime of life. physical stamina and regenerative powers gradually diminishing
Copyright, 1927 by The Dentists' Supply Company of New York
Birth
90 Years

understanding of the idea of service as provided by nature, of the logic of maintaining that service by feasible preventive measures, and of the eventual restoration of service by corrective means. It is believed also that the chart can be a valuable aid in establishing a sense of responsibility justly to be assumed by both the dentist and the patient. Its application is felt to be of equal value in each of the various phases of dental practice. One conception of its application to the practice of full denture construction is described herein.

The circle is arbitrarily and equally divided into ninety segments, each one representing one year, the total intended to encompass the entire span of a human life. Added psychological value is given to the chart in the original because of the various colors used to distinguish like periods in the history of dentition, the continuity of which will be explained in the succeeding paragraphs.

Beginning at zero, or at birth, the first five years denote the time consumed by nature in the development of the deciduous teeth, a process providing adequate efficiency for the immature needs of infancy and early childhood. The seven succeeding segments depict the gradual development, beginning with the first permanent molars, of the complement of natural dentition intended by nature to render service throughout life. Attention is directed to the fact that the entire ensemble is not provided at once, but that, for reasons perhaps not clearly understood, pairs of like teeth in proper antagonism are successively erupted and occluded, and that such progress extends over seven years until at about the twelfth year a period of developmental quiescence is entered upon which endures through a few years until the third molars become evident and finally come into occlusion at about the eighteenth to the twenty-first year of life. Nature deems it necessary to utilize approximately twenty-one years to produce an efficient masticatory apparatus—a fact seldom if ever considered by the uninitiated. This entire developmental period is designated by Segments 1-21.

The next section of the cycle portrays that period of the life of the teeth in which they reach their greatest efficiency, and which is associated with the need of but little dental attention. Assuming that the individual has had reasonably effective professional supervision, one does not expect to find much evidence of disintegration. Of course, this period of maximum excellence of the physical condition of the teeth and their supporting tissues varies and may cover only a few years, yet it may last for a considerable number of years. The chart presents that time of life from the twenty-first to the thirty-first year as the peak of dental efficiency.

The next section of the chart represents a period of tooth life and supporting-tissue life of very grave importance, and one which should be of great concern to the individual. It embraces the many varied and progressive processes of disintegration that so inevitably confront a very great number of individuals. The chart emphasizes the fact that slowly but surely caries and other disease factors finally become acute, and the first really important lesion demands attention.

The first sizable filling or inlay becomes necessary. Special attention is directed to the thought that the truly marvelous assembly of natural teeth of which nature so painstakingly developed through so long a period of time has finally begun to break down.

After the continuity of tooth surfaces has been restored (at about the 32nd year on the chart), there follows a period of reestablished efficiency, which covers a varying extent of time. Altogether too soon, however, evidence of further and perhaps more extensive deterioration of oral tissue is manifested. The tooth or teeth previously restored to service possibly can be looked upon no longer as subject to restoration by means of a filling or fillings. The first complete crown restoration is indicated. Again, when continuity has been reestablished (about the 33rd or 34th year on the chart), there follows yet another season of renewed efficiency, only to present eventually added and perhaps greater restorative need. Possibly the crowned tooth is lost and the first space develops, therefore complete tooth replacement is in order. The first bridge comes into existence (about the 37th or 38th year on the chart).

There follow alternately reestablished dentition and further extension of tooth loss. Greater bridge restorations are needed, to be succeeded in turn by even more extensive restorative measures, until (at about the 42nd or 43rd year on the chart) there are but few of the natural teeth left. Bridges of any type are indicated no longer, and the partial denture becomes the only recourse.

Eventually, and in spite of the fact that all that is humanly possible has been resorted to in order to arrest the final elimination of all the natural dentition, the individual is confronted by the final and only expedient left—the full denture (about the 48th year on the chart). During all this later period there has been a very persistent as well as destructive pathological development in the mucous, submucous and alveolar tissues, otherwise the teeth themselves would not have been lost (indicated in the marginal bracket outside the circumference of the circle).

It is believed that the panorama of the life history of natural teeth as conveyed by the verbal and visual presentation thus outlined enables a lay mind to understand more clearly their very grave importance, so that the average individual will be more likely to conceive a true valuation of the worth of teeth. By retracing one's mental steps to that time of life included in the field from the twenty-first to the thirty-first year it should not be difficult for the dentist and the patient to arrive at a mutual understanding of the fact that nature provided those very excellent teeth for the major purpose of *service*, and that the average individual would not readily exchange that service for any theoretical equivalent value. Nor would there be a likelihood of the ideal of esthetic and phonetic values being excluded from that concept of service.

It is doubtful whether any one would place a valuation of even many thousands of dollars upon his natural teeth if, in so doing, it meant their deliberate loss. By the same token a vast number of people today do not hesitate to make material investments in their teeth from time to time by way

of the various types of corrective measures depicted throughout the chart from the thirty-first to the forty-eighth year. Perhaps these investments are not so readily understood as service charges, but when that fact is emphasized, as it is in the chart, one can expect a ready agreement with that thought. It is believed that very few people would hesitate to repeat the same monetary expenditure should occasion demand it.

Now that a premise of service instead of material units has been established, attention is directed to the very narrow segment referred to in the marginal bracket as representing one month of time at about the forty-ninth year of life. Not infrequently, and because of lack of understanding, the layman thinks that he requires complete restoration at once. He does not realize the fact that he is in somewhat the same status as he was at the beginning of life, at which time a far more competent artisan than any human being can ever become began developing the apparatus which eventually would be of genuine service to him, nor does he realize that nature took approximately twenty-one years to complete that mechanism.

The narrow strip at the theoretical forty-ninth year, as compared with the much more extensive one included between the first and the twenty-first years, demonstrates the absurdity of the request that any one produce real service in but a few hours' time. While it is true that the element of physical development is not a factor at maturity, and while it is equally true that the detail of denture construction need not require a proportionate length of time, it is certain that the rendition of service is something more than the mere mechanical procedure attendant upon the assembly of teeth. If the combined technical knowledge and mechanical skill do require one month, or even more, in which first to construct the devices designed to establish service and then to accomplish the necessary adjustment, that time is lightning-fast when compared to the time consumed by nature. The comparison on the chart tends to emphasize the importance of sufficient time in which to do the work as carefully and as well as possible. Again, a comparison will tend to establish in the patient's mind the fact that the physical distress attendant upon the eruption of the natural teeth, if concentrated into a period of a few weeks, would greatly exceed the comparable distress attendant upon the adjustment of artificial restorations covering a similar period of time. It is probable that there would be less tendency to place the burden of responsibility upon the dentist.

The adjacent strip, the balance of the forty-ninth year, narrow as it is, is comparable to the period from the twenty-first to the thirty-first year, since it represents a period of time during which, after adjustment, the dentures may be expected to render service without appreciable discomfort and loss of efficiency.

There follows, then, a much more extensive field similar to the one representing life from the thirty-first to the forty-eighth year. It portrays the expectations as to oral conditions for the balance of life. Just as was true in the initial period of disintegration,

during which not only the teeth gradually deteriorated but the supporting tissues as well were subject to disintegration, so it is true that tissue change occurs at the latter period of life and in all probability continues until the end.

Nature was never questioned nor were personal habits called to account by the layman during the time that the natural teeth remained in the mouth. It merely is considered regrettable but unavoidable that the natural teeth of indeterminable value become defunct.

The chart can be an aid in conveying to the lay mind the fact that the tissues supporting the artificial restoration are still vital, that they are still subject to the laws of cause and effect, that their reaction to the several factors causing absorption are within the control of human agencies no more at this latter time of life than they were at an earlier period, and that there will be need to resort from time to time to certain restorative measures. It emphasizes also the fact that the burden of reestablishing a functional status still remains the obligation of the patient, just as was the case when the natural dentition was being constantly reconditioned with more or less grateful willingness on the part of the patient to assume the financial responsibility of service maintenance.

Economically it is believed that the chart is of value as a means of establishing a basis for adequate valuation of denture service. By virtue of its possibility of focusing the mental vision upon the entire range of monetary equity in the mouth, and because the patient has seen the legitimate worth of the service thus maintained, it becomes clearer to him, in the event of actual service, after a restoration has been made, that that service should be of as much value now as at any time in his life.

The extent of such service depends upon how much care, in addition to adequate skill, is put into the effort of restoration. Certainly intelligent use of acquired proficiency, adequate materials and sufficient time can produce the required means of rendering real service. Dentures of themselves cannot be service; they can be only the means to the desired end. Their superiority can be proportionate only to the care and proficiency employed in their development. The assertion is advanced that actual difficulty need not exist with regard to an adequate fee, provided an actual and mutual understanding of the problems at hand and of the objectives desired and obtainable exists between the patient and the dentist.

The chart can be an aid to the periodontist in connection with the emphasis to be made regarding preventive measures, to the orthodontist in connection with the education so necessary as to the increased serviceability of correctly aligned natural dentition, to the exodontist because of its portrayal of the processes of disintegration and the advisability of preventing further development of that process so far as possible, to the general practitioner in respect to his effort to educate his clientele to the full meaning of his services.

220 West 42nd Street

Dental Education: A Factor In Public Welfare*

By JAMES SULLIVAN
Assistant Commissioner of Higher Education, University of the State of New York

A SUMMARY

Dental education has required more and more preparation, and it has received more and more respect from the public. If you are to make any profession respectable, you must make the educational requirements high. If you are to make dentistry as highly respected by the public as is medicine, the educational requirements must be equal to those of medicine.

The more that is required from the professional man in preparation for his work, the more he must exact from the public in return for his services. If his education is going to cost him $10,000 and the loss of earning power for several years, his earning power during the years that are left him must be high.

A new person is coming into the field of dental service in the form of the dental hygienist, who can do certain kinds of work. The only trouble is that when the hygienist is employed the bill goes out as if the dentist had done the work himself, which is not acceptable to the public.

I do not see how we can regard your dental education as anything but a phase of medical education. I feel that you are physicians with a specialty.

We wish to bring certain phases of preventive dentistry to the public notice in order that people may take proper precautions for their children's teeth. It is a hard job. We preach and preach about diet and are almost discouraged to find that what we say goes in one ear and out the other. The human creature will take a greater chance with his life and health than with anything else. For every one hundred persons who will insure their houses, not more than fifty will insure their bodies.

Years ago, when I had just become principal of a boys' high school in Brooklyn, I investigated the care of the teeth. The Board of Health, which is in control of the health work in the schools, sent me a physician for this service and he signed his name daily to a book and then ran away. I told him that I did not consider that proper health inspection, to which he replied that he expected the teachers to pick out the children who needed attention and send them to him. I went to the Board of Education and said that I wanted somebody who had a knowledge of medicine and oral hygiene. They sent me a nurse. I put her into the gymnasium and set her to examining teeth. She got the boys to take care of their teeth and to go to dentists for more serious conditions.

It is a dangerous thing in our civilization when women cannot have children because of the excessive expense.

When you hear groups of men in country clubs and other clubs about the country saying that any group of men in a profession is a band of rob-

* From an address delivered before the First District Dental Society, New York, November 7, 1927.

bers because of excessive charges, something is wrong.

Our upper classes can take care of themselves, so far as professional service is concerned, because they have plenty of money. The poor receive medical service at the expense of the city or state. Where can people of the middle class go? They cannot plead poverty. They are compelled to stay away from medical and dental offices.

The daughter of a friend of mine had two lower incisors erupt slightly in advance of the upper incisors. He took the child, when six years old, to an orthodontist and asked what it would cost to have the condition corrected. The orthodontist said, "Twelve hundred dollars." The father was earning $1,800 a year as a teacher. Under such conditions he was compelled to neglect the child. A dentist who was not exclusively an orthodontist corrected the condition for seventy-five dollars. Now the young lady has a very fine set of teeth.

Some of these problems which I have suggested are very important in public welfare. You must consider them. I make no plea for the wealthy and the poor, but I ask your consideration for the great middle class which lies between them. That is the class which should be providing the population of this country and at the present time is not and cannot.

Dental Education: A Factor In Public Welfare*

By WILLIAM J. GIES, Ph.D., F.A.C.D.

A SUMMARY

Dentistry is a division of health service and is valuable not only as a means of restoring health but also for the purpose of keeping people well. This service is achieved for the most part by mechanical and esthetic means.

Dentistry, nursing, community health education, public health administration, pharmacy, optometry, etc., are included in the broad concept of medicine because they are supplying a health service, but only those who hold an M.D. degree are eligible to practice medicine. These alone are physicians. Dentists cannot practice medicine nor can physicians practice dentistry.

The greatest usefulness of dental education is the promotion of oral health. Dental education may be divided into four types: (1) dental education of the public, (2) dental education of the prospective dentist, (3) dental education of practicing dentists, (4) dental education of practicing physicians.

The education of the public should be given in simple and easily understood terms, presenting rules for personal care and the knowledge of what to do in case of ill health. This can be done by physicians and nurses, dentists and dental hygienists, and can be given most effectively in the practitioner's office, the public school, and meetings of parents' associations.

* This address was delivered before the First District Dental Society, New York, November 7, 1927, and will be published in toto in the *Journal of Dental Research*.

In the education of the public, dentistry has been far ahead of medicine in urging patients to submit to examination at definite intervals. The public, however, should be made to understand that philanthropy is essential for the advancement of dentistry. Up to the present time bequests and endowments have been few and far between. Notable gifts have been those of Mrs. Montgomery Ward, the Forsyth brothers, and Mr. Eastman.

Until now dentistry has been handicapped by the comparatively small amount of preliminary education demanded. The requirement of two years' work in an academic college will increase the self-respect of the dentist and will improve the relationship between dentistry and the other professions. It will develop teachers, research men and leaders for the future.

The dental school must strive to turn out good, general, all-round men and not endeavor to make every graduate a specialist, in all branches. The attempt to do this is one of the deficiencies in modern dental school education.

Every practitioner of health service must keep fully abreast of all the developments in his field. The dentist should attend society meetings and, from time to time, take short intensive courses. The university dental schools should provide short, advanced courses for practitioners.

A great many physicians are ignorant of clinical dentistry and need education in oral hygiene and oral medicine. These subjects have always been ignored by medical schools. The physician must be shown the true value of dentistry to human welfare. Dentists must learn more of the conditions in medical practice, and the physician should show a finer spirit of helpfulness.

AWARD OF MORRIS L. CHAIM PRIZE FOR 1928 BY FIRST DISTRICT DENTAL SOCIETY STATE OF NEW YORK

The Morris L. Chaim Prize for 1928 has been awarded to Dr. Samuel Goldberg, Johannesburg, South Africa, for his paper on *Biometrics of Identical Twins from the Dental Viewpoint.*

Paradental Pyorrhea and Alveolar Atrophy*

By DR. BERNHARD GOTTLIEB

A SUMMARY

One of the most frequent sources of filth pyorrhea is the extension of cavities in a cervical direction for prevention. Black concluded that, since the bottom of the natural pocket of the gum extended to the cemento-enamel junction, the freedom of this area from caries was due to the fact that it was below the gum line. This was not a correct deduction, and the area is immune only because eruption has not fully taken place. All restorative work should be kept above the gum unless esthetic reasons demand otherwise. This will greatly reduce the incidence of filth pyorrhea.

Paradental Pyorrhea

Inflammation and suppuration are caused by the activity of micro-organisms, and consequently mechanical irritation may be excluded as a causative factor. These organisms are different from those that cause caries, because destruction of the root surface is not found very frequently in pyorrhea.

The presence of a deep pocket is necessary for paradental pyorrhea, and not only must the deposits be removed from the surface of the root, but the inner wall of the pocket also should be scraped. If all the connective tissue is removed, the result is the same as if the gum had been trimmed away. It is possible for the gum to heal to the surface of the tooth, and this action is governed by the laws of replantation. The best massage is the use of the toothbrush according to the Charters method. When suppuration persists, the gum should be cut down to the bottom of the pocket, and Balters insists on the cutting of V-shaped notches labially and lingually to provide drainage and permit smooth healing.

Alveolar Atrophy

All inflammation causes atrophy of the surrounding bone, which may regenerate later. Consequently, when pyorrhea has been cured, a tooth will become firmer, but hope for the permanence of this condition should not be raised too high. The continual eruption of the teeth tends to render them less stable and, while the length of the crowns may be reduced, the shortening of the root cannot be prevented. Only teeth that erupt very slowly have relatively long roots.

Traumatic occlusion has been under discussion for several decades, and it is well known that natural dentures in elderly people show extensive wear of the cusps. Mastication with strongly formed cusps throws a greater stress on the dentures than when the cusps are worn down. Consequently the wearing down of the cusps with advancing age compensates for this. Stillman and McCall maintain that a tooth that is subjected to traumatic occlusion produces either a condensing osteitis or a collapse of the investing tissues.

* From *Die Fortschritte der Zahnheilkunde*, Leipzig, Germany.

Howe and Grieves believe that they can see a connection between pyorrhea and a deficient nutrition, but what they have produced is scurvy, which is an entirely different process. The guinea-pig, which is generally used for these experiments, has continuously growing teeth, and with this type of dentition alveolar atrophy is an utter impossibility.

Box and McCall state that chronic periodontitis is a curable disease, meaning by this that the bottom of the pocket can be relocated at the cemento-enamel junction. Traumatic occlusion is held to be the chief causative factor in that it lowers the resistance of the tissues. However, for a tooth to be subjected to traumatic occlusion it must first of all move from its place in the alveolus, and this movement is the primary cause. Traumatic occlusion is the result of this first deviation from the usual.

In rarefying pericementitis fibrosa Box describes the formation of a new tissue which is held responsible for the destruction, but Gottlieb does not consider this to be correct. Box claims that the new growth is the cause of the atrophy, while Gottlieb declares that the atrophy originates the new growths. Among rodents and herbivora we find a balance between the wearing down of the teeth and the rapidity of their eruption. This occurs also in the natural human denture. Metal fillings and porcelain crowns interfere with this process and must be compensated for by grinding. Substances of the same degree of hardness should not come in contact with each other. Enamel or porcelain will wear down gold, and when two gold fillings are opposed to each other, they should be of different degrees of hardness. The grinding in of the articulation should not be delayed until the teeth have become loosened.

In certain cases, movable-removable bridgework—such as advocated by Chayes—is an advantage, but its merit is not that it permits the anchor teeth to move but rather than it permits the saddle to move and so lessens the strain on the abutments. A loose tooth is not the most efficient, and this means that the maximum and optimum of movability do not coincide. It is more desirable that a tooth be so firm that it will not yield at all rather than to have it pull at the investing tissues with every movement.

If the bottom of the natural pocket is found to be even on the circumference of the teeth and has not passed below the cemento-enamel junction, then a removable bridge of any kind may be used. If the teeth are already loose, then this mobility should be reduced to a minimum and a movable-removable bridge is contra-indicated. No one system is absolutely perfect and effective. Bridges should be made as hygienic as possible and in such a manner that the abutments may be easily kept clean.

Oral Surgery In Practice

By JAMES L. ZEMSKY, D.D.S., New York, N. Y.
Attending Surgeon, Department of Oral Surgery; Chief of Clinic and Director, Surgical Periodontia Department, Midtown Hospital, New York

(*Continued from March*)

ANOMALIES

¶343. Adults having temporary teeth should not always be advised to have them removed if there is no pathology associated with them. Many cases have been observed in which patients have had better use from their "baby" teeth than from artificial restorations. (See Figs. 382-383.)

Fig. 382

CONGENITALLY ABSENT TEETH

Roentgenogram showing congenital absence of a maxillary lateral. (See ¶343.)

Fig. 383

Roentgenogram showing congenitally absent mandibular central incisors. (See ¶343.)

¶344. The fact that all teeth have erupted does not prevent the possibility of patients having supernumerary unerupted teeth. Cases presenting a neuralgic pain of vague etiology have occasionally been relieved when abnormally situated teeth, discovered by roentgenographic examination, were removed. (See Figs. 384-392.)

Fig. 384

SUPERNUMERARY AND MALFORMED TEETH

Roentgenogram of a malformed, unerupted and malposed maxillary third molar. (See ¶344.)

Fig. 385

Roentgenogram of a normally formed, fully erupted maxillary (supernumerary) fourth molar. (See ¶344.)

Fig. 386

Fig. 387

Figs. 386-387

Roentgenograms revealing the presence of two rudimentary supernumerary unerupted maxillary teeth. Such teeth often act as peripheral irritants, causing neuralgic disturbances. (See ¶344.)

Fig. 388

Roentgenogram revealing an odontoma in the mandible—four fully formed miniature teeth are clearly seen. Such an abnormality must be corrected by surgical removal. (See ¶344.)

Fig. 389

SUPERNUMERARY UNERUPTED AND MALPOSED TEETH

Roentgenogram showing a supernumerary unerupted and malposed mandibular premolar in a vertical lingual position. (See ¶344.)

Fig. 390

Roentgenogram revealing the presence of an unerupted and malposed supernumerary maxillary molar. (See ¶344.)

Fig. 391

Fig. 392

Figs. 391-392

Roentgenograms showing unerupted and malposed mandibular canines.

¶345. Well defined radiolucent areas closely simulating cysts are often found associated with perfectly normal structures in the region of the maxillary canines and premolars. In these cases no operation should be undertaken unless it is proved beyond a shadow of doubt that these areas are not merely "low antra," which are absolutely healthy conditions and consequently require no surgical interference. (See Figs. 393-396.)

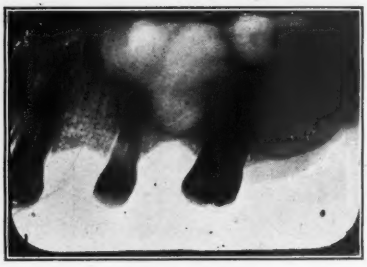


Fig. 393

Large and Low Antra

Roentgenogram of a maxillary canine, premolar and molar showing a low antrum. (See ¶345.)

Fig. 394

Fig. 395

Figs. 394-395

Fig. 394 shows a roentgenogram of a right maxillary lateral, canine and premolar carrying a bridge. This revealed a radiolucent area over the canine and premolar, a condition which was suspected to be a cyst. To confirm this diagnosis, a roentgenogram of the opposite side was taken (Fig. 395), which disclosed a similar condition. From these two roentgenograms the presence of a cyst was excluded, the condition being merely a large antrum. (See ¶345.)

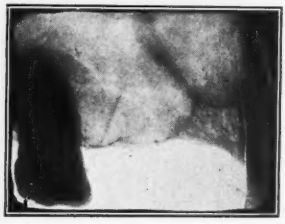


Fig. 396

Roentgenogram of a maxillary molar and premolar region disclosing an unusually low antrum. (See ¶345.)

¶346. To rely only on the clinical appearance of the teeth may sometimes cause considerable embarrassment in extraction. Even loose pyorrhetic teeth may fracture when they have abnormally formed and curved roots. (See Figs. 397-398.)

¶347. Direct communication has been observed to exist between the sockets of mandibular molars and the submaxillary region. Careless curetting of such areas may result in infection by direct forcing of the septic material into them. (See Figs. 399-404.)

Fig. 397

MAXILLARY TEETH WITH ABNORMALLY FORMED, CURVED ROOTS

Roentgenogram showing maxillary premolars with abnormally formed and curved roots, which almost invariably present serious difficulty when removal becomes necessary. (See ¶346.)

Fig. 398

MANDIBULAR TEETH WITH ABNORMAL AND CURVED ROOTS

Roentgenogram of mandibular molars with abnormally formed and curved roots. These will present considerable difficulty when extraction is attempted. (See ¶346.)

Fig. 399

Photograph showing a probe introduced into the socket of an extracted mandibular molar. This passes into the submaxillary area and pushes out the soft structures, thereby presenting an appearance of submaxillary swollen glands. (See ¶347.)

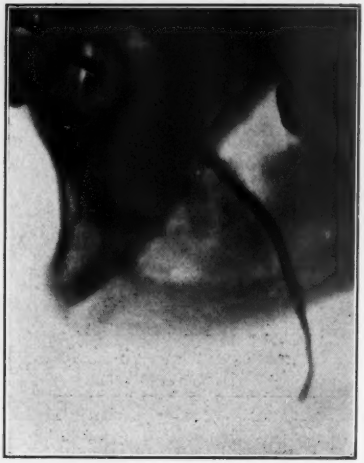


Fig. 400

Roentgenogram showing that a probe introduced into the socket of the first molar passes into the submaxillary region. This roentgenogram is of the same patient as in Fig. 399. It explains the reason why an infection from the mandibular molars so easily extends into the maxillary areas. (See ¶347.)

Fig. 401

Roentgenogram showing the type of mandible in which there exists a direct communication between the socket of the third molar and the submaxillary structures. (See ¶347.)

Fig. 402

Roentgenogram of the same mandible as in Fig. 401. This was taken after the third molar had been extracted and shows the probe introduced into the socket passing into the submaxillary region. (See Figs. 399-401; also, ¶347.)

Fig. 403

Fig. 404

Figs. 403-404

Roentgenograms of mandibular molars showing the types of mandible in which a direct communication between the sockets of the molars and the submaxillary regions exists. In most instances this condition may be diagnosed from the appearance of the tissues on the roentgenogram, which presents almost structureless areas. (See ¶347; also, Figs. 399-402.)

¶348. "Antra" have been shown to exist in the mandible occasionally. Such abnormalities should be kept in mind when radiolucent areas are seen in roentgenograms of the mandible. (See Fig. 405.)

Fig. 405

Roentgenogram of a patient, 16 years old, who had pain in the left mandibular molars. This reveals a circumscribed radiolucent area resembling a cyst in appearance. Operative findings disclosed a smooth lining (a sort of antrum), which obviously is of embryonic origin and not a pathologic condition. (See ¶348.)

Fig. 406

Photograph of the lingual aspect of a dry specimen of a mandible showing the penetration of its inner plate by the apex of the third molar. During extraction such roots are often fractured, and when an attempt is made to remove them, they become embedded between the mucoperiosteum and the bone. Care should be exercised not to force these fragments down into the deeper structures, for great difficulty will be encountered in their removal. (See ¶349.)

Fig. 407

Roentgenogram showing the fractured apex of a third molar forced into the mylohyoid space. (See ¶349.)

Fig. 408

Roentgenogram of the same area as in Figs. 406-407 after the fragment had been removed. (See ¶349.)

¶349. Root apices of the mandibular third molars sometimes perforate the lingual plate, extending into the mylohyoid fossa. When roots of these molars are fractured, the apices are to be sought in this space. (See Figs. 406-408.)

355 East 149th Street

(*To be continued*)

Porcelain Manipulation

A Practical Technic for the General Practitioner

By F. R. FELCHER, D.D.S., Chicago, Ill.

XXIV

PORCELAIN BRIDGES

The making of porcelain bridges is not complicated as far as construction is concerned, but the application of this type of restoration should receive a great deal of consideration. They should be used only where indicated, as there are great limitations which interfere with their successful use in many cases. For instance, the use of an all-porcelain swing-on bridge, which is described simply as a large porcelain jacket crown shaped to resemble two teeth, would be a failure if the stress of mastication were applied on the dummy. There is no means of compensating for such stress (lever stress), and the dummy tooth would be fractured.

In the discussion of porcelain jacket crown preparations considerable thought was placed on the idea that, in order to have a porcelain jacket crown that would not break during attrition, the preparation should be such that the stress would be absorbed at the point where the stress is applied. This would prevent the distribution of the stress to a weaker portion of the preparation, and there would be no danger of breakage. There is no means of compensating for lever stress, and that is the kind of stress which would be encountered were a dummy tooth to be a part of the porcelain jacket crown and placed in direct occlusion. Therefore, if stress were applied on the dummy tooth, it would be transmitted to the porcelain jacket crown, resulting in breakage of the crown. It is obvious that the dummy tooth must be removed from use.

This is, of course, a handicap to the patient whose teeth are in natural occlusion. It may be argued that the use of a platinum lug protruding from the dummy and resting on the contact tooth would help, but that is true only to a degree. Porcelain and metal do not unite, and it is a safe assumption that the use of a platinum lug might encourage fracture, especially if strain were put on the tooth. A porcelain lug surely is not indicated, because of the friability of the material. It is questionable whether a lug resting on a sound tooth in a fixed bridge case is considered good practice. In cases where a lug is used, it might be good policy to place a small gold filling in the tooth where the lug comes in contact.

Some cases may be made where two porcelain abutments and one dummy can be used, but the difficulty of paralleling the abutment preparations is encountered, and this must be done if the bridge is to be seated in place. Observation of these bridges, especially all-porcelain bridges of great span, does not lead to an encouraging opinion of their use.

The author hesitates to recommend

all-porcelain bridges, with the exception of the swing-on bridge with a tube baked into the dummy and an arm of some sort, which arm is made a part of an inlay in the contact tooth and fits into the tube after the bridge is placed, a little play being allowed in the tube to compensate for tooth movement. This arrangement and the method of construction which will be described later in these pages should always be used where the dummy tooth comes into direct function. The all-porcelain swing-on bridge without some additional protection can and should be used only in cases where there is no bite on the dummy tooth, and the patient should be informed that he must exercise care. This does not lead to a happy frame of mind on the part of the patient, to say the least.

In 1917 the author, in collaboration with Dr. H. W. Hamilton, devised an attachment by means of which swing-on bridges could be used more safely.* The principle of the attachment was to enable the building of a casting covering the tooth, and to this casting was soldered a tooth or teeth. A few bridges of that type were made and shown in clinics at Columbus, Ohio, in December, 1918; at Chicago, Ill., in January, 1919; at Elgin, Ill., in October, 1920, and at other places. Quite a few of this type of attachment and bridge were made for patients and friends of the author with successful results, and at the present time the attachment principle is widely used with a great degree of success.

To describe it briefly—a casting is made in the form of a core to fit over the abutment tooth with an absolutely perfect preparation of a tooth for a jacket crown necessary for that case. That is, if a central tooth is to be used as an abutment, the core preparation must be a perfect central preparation, so that the stress will be compensated for without a distribution of the force. At the portion where the dummy tooth is to be attached the core should fit the shoulder perfectly, and enough gold is exposed to allow for the use of solder for the attachment of the dummy tooth. The balance of the casting takes a part of the shoulder, and the jacket crown is then made to fit the shoulder, except where the gold is exposed. There the porcelain jacket crown fits on the shoulder made in the exposed gold.

When the proper kind of gold is used, a gold in which, after casting, the hardness is the same throughout without possible bunching of the different metals, a thin, strong casting can be made and, if stress is applied on the dummy tooth, the stress is taken up by the gold core rather than by the jacket crown. Where a lug is desired, an arm may be made to protrude from the dummy casting to rest on the contact tooth and act as a support. The use of this attachment is not limited to a swing-on bridge, but can be for a bridge of more teeth, offering the advantages of strength and replaceability, and when properly designed it will show no gold, as the portion of the gold core to which solder is to be applied can be placed and modified for the different typal forms of teeth.

High-fusing porcelains should be used in the construction of porcelain bridges because of the greater degree

* *The Dental Cosmos*, July, 1921.

of strength of these bodies. Low-fusing porcelains are believed to break more easily under shock or stress, and of course in firing they tend to shrink more than do higher-fusing porcelains, therefore requiring many more firings with the danger of overfiring the first layers of porcelain.

Constructing an All-Porcelain Swing-On Bridge

Prepare the tooth and take impressions.* Pack the amalgam die and the contact teeth, and, after these have set properly, trim the die, place it in the wax core in the impression and prepare the models.

Select the porcelain indicated for the case and build up the body color to cover the matrix, replacing the die in the model to correct any misalignment. At this time it is advisable to build up some of the body color on the side of the tooth to which the dummy is to be added. A finger, covered with a clean handkerchief and held at the lingual of the model, will support the porcelain and prevent it from having too much water. Be sure that the covered finger is applied only when the porcelain is being applied and withdrawn when there is no manipulation, or the porcelain mix will become too dry. When a sufficient quantity of the body color has been applied, remove the work from the model and ditch the shoulder of the abutment tooth, as in this case the shrinkage will be too great for the platinum resistance. This can be done with the point of the blade of the carver or with a No. 3 explorer. Use a brush to dust away any excess porcelain. Dry out carefully and place in the furnace at a fairly low temperature. After the work has burned white, shut the door and, if the temperature is near 1600°, move the rheostat lever to the button required to allow the furnace to reach from 1900° to 2200° F. in five minutes. Set the timer to ring in five minutes, and when the 2200-degree mark is reached, raise the rheostat lever to a button which will allow it to read 2300° in about three minutes. Remove the work, which should show a low biscuit-bake.

Replace the work on the die, burnish the platinum at the shoulder and fill in the ditched porcelain with body color. Continue to add body color to the abutment and dummy teeth until they are sufficiently built up, and then add enamel color as desired.

In a small bridge build the case to resemble two teeth larger than needed. Allow the length to be considerably beyond the adjoining teeth and have the case somewhat fuller. Then remove, adding to the contact points sufficient porcelain so that when the case is fired it will be too wide. Brush the excess around the shoulder and remove from the die.

Fire again as described above, but carry the step above the 2200-degree mark to 2400° F. in five minutes, at which time the complete shrinkage of the body will have taken place, and then remove from the furnace.

The author uses a dye material to stain the water used for the enamel porcelain which helps to keep the enamel and body colors in their respective places. This can be made by

* See chapters on *Preparation* and *Impression-Taking*, The Dental Digest, January and February, 1928.

securing a red dye such as can be purchased in the drug store. Pick up a very small quantity of the powder with the palette knife and add it to some clean water in a separate water bottle. Shake well and use only for the enamel color. The dye will burn out without having any effect on the porcelain color and will not interfere in any way with the firing of the porcelain.

At this time the bridge will be too large for the case. Now, with stones or coarse paper disks trim the case at the contacts until it is perfectly seated between the contact teeth. The little marks made by the amalgam contact teeth assist in spot-grinding the case until it is perfectly seated. Next, use the coarse paper disks to trim the abutment tooth to the shoulder. Then grind the labial portion to alignment and character, grind the lingual as needed, and finally trim to proper length. Disk carefully and wash with a brush, making sure that there are no foreign particles left, after which dry with a clean handkerchief. The fingers should be kept away from the porcelain. A little dry porcelain powder may be rubbed over the bridge with the handkerchief, and the case finally fired, as follows:

Place in the furnace and, when the pyrometer reads about 1600°, move the rheostat lever to the button which will allow the temperature to reach from 1900° to 2200° in five minutes and to reach 2350° in four more minutes. Then hold the temperature at 2350° for about five minutes, or for the required time which experience shows, and when completed allow the case to cool in the furnace, if possible. Otherwise, take out of the furnace and place under a glass until cool. Allowing the work to cool in the furnace will tend to temper the porcelain and will give a better result.

By firing as suggested above, there will be no danger of "balling" the work, as will be caused by a higher temperature, and of destroying all the character of the teeth which has been placed in the work. Fine lines or certain characteristics needed in the case will be reproduced perfectly.

High-fusing porcelain should not be allowed to reach a higher temperature than 2400° at any time during the biscuit firing, for at about that temperature the maximum of shrinkage will have taken place, and during the final firing 2350° should be the highest temperature the work is allowed to reach, compensation for heat being gained by the required time at that degree. It is essential at all times to consider that the lower temperatures and longer time allowed for baking is the ideal way to fire any ceramic material.

If a tube is desired to act as a support and help break the stress, prepare the contact tooth for an inlay which will allow removal as parallel as possible with the removal of the bridge from the mouth. Cast the inlay, allowing for the soldering of a pin which subsequently will be set in it.

Cut a small quantity of the porcelain from the dummy tooth of the bridge. Select a platinum tube somewhat larger than the pin to be used in the inlay, or wind some platinum foil over a larger-gauge wire. Now set the tube in place in the dummy, cover with low-fusing porcelain and fire. Do not use medium-fusing porcelain, as it will

be too high. When the case is fired, dress the excess of the tube flush with the dummy, take a careful impression of the case with the bridge and inlay in place, set the pin in the proper position, invest the inlay and pin, and solder. When the case is finished, cement as follows:

Mix the cement, place it in the crown and on the inlay, making sure that none enters the tube. Place the pin of the inlay in the tube of the bridge, set in position over the teeth and hold until set.

7616 Phillips Avenue

(To be continued)

Research In Oral Pathology

The medical school at Yale has inaugurated work in the field of oral pathology. This does not mean the beginning of a dental school but the scientific study of oral phenomena as a part of medicine.

Dentistry is largely a technical procedure concerned with the restoration of tooth surfaces, while medicine, up to the present time, has ignored the mouth. This neglected field will be cultivated in a scientific manner.

It is proposed to select a group of young men, ground them in the fundamental sciences, and then set them to work under the best possible conditions. Eventually there will be created a supply of investigators, consultants and teachers for dental and medical schools. With the development of this project the medical student will receive an interpretive course in oral medicine.

At this school a few fellowships are available so that the student, who otherwise could not afford it, will be able to take up the work. The qualifications of the men will be carefully examined and they will be appointed chiefly on the recommendation of teachers in the biological sciences.

To What Extent May American Achievements In Dentistry Be Applied to German Conditions?*

By DR. HANS SCHERBEL, Leipzig, Germany

Just as the technical achievements of the Americans attracted our attention at the Seventh International Dental Congress in Philadelphia, so, with the same intensity, the inventions and improvements in our own specialties could not but impress us. There was so much of everything that it was difficult to absorb it all, especially with the heat spell and the unfamiliar language and surroundings. Things not even known from hearsay, machinery and apparatus and all sorts of valuable material and aids for practice, were presented.

I can easily understand why Thielemann complains that much was not correctly presented by those reporting the Congress. That, however, may soon be corrected, because these authors have prepared the field for him with their descriptions. Now, two years later, it is easier to get a perspective of conditions in the New World, to free one's self from the hugeness of things and, so to speak, draw a closing line underneath.

It is not worth while to go into the details of what we saw in America, as it has been pictured in good articles by members of the excursion parties, by some with enthusiasm, by others with scepticism. But the place that the individual occupies in America and in Europe (for the difference between the several States in Europe, as compared with America, is very slight) in the practice of dentistry may merit our attention. So many of the American innovations and inventions have found a permanent place in our science. Some, to be sure, are still meeting resistance, but (I often ask myself) why has much that was admired, or at least approved, by all colleagues not become common property? The favorite saying of "clinging to old customs" can hardly be called the reason for this. It is of less pertinency in dentistry than in any other science and would, moreover, apply only to a small number of dentists, for with most colleagues the opposite rather is the case.

During the War, as well as afterward, development in America and Europe (not only in the domain of dentistry) followed different paths. In rich and mechanical America it plunged, first of all, into the technical, in line with its whole make-up; in Europe, in the other direction, into the spiritual, that is, in our profession into the medicinal. The absence of personal contact with colleagues and the difficulty in obtaining literature have widened the chasm. As regards the technical side, Europe has produced hardly anything of importance during the last fifteen years, while America can show us almost nothing to compare with the pathological-histological work of the Vienna School, Euler, Weski, Bauer, and others. It is easy to understand why Kantorowicz said that we were ten years behind (in cer-

* Translated from *Zahnärztliche Rundschau*, December 2, 1928.

tain lines!), but with reference to science in America we can very well say the same thing. The peculiar conditions, exclusively, have caused these exceptional phenomena, and it is not to be supposed that they will be repeated. Even now, after a few years, the names and meaning of things that we did not know before are familiar to us, as, for instance, unit, jacket crown, Roach attachment, etc. I wonder if the Americans during the same time have become acquainted with the research work of Gottlieb, the man whose wonderful microphotographs caused universal admiration in Philadelphia.

In a consideration of American conditions we must guard against one mistake, that is, our inclination to generalize. It is so easy to say "the Americans." But what we saw in America was only the outstanding points. A dental profession which is about eight times as numerous as in Germany, for instance, is able to produce a greater number of specialties than we. A "Kassen"* dentist, who is obliged to work early and late for his daily bread, is unknown in America, and such a one, moreover, will never be able to do work that could be called outstanding.

It is incorrect to say, as did Fritsch (Frankfort), that the average work of the American dentist is superior to that of his German colleagues. I have seen plenty of work of American dentists that was very bad, both in America and in Germany. But that kind of work is not seen at congresses or on visits to individual American colleagues on Fifth Avenue. The dentist who there makes gold crowns for $5.00 (and that is done not only in the negro sections) will do as little fine work as would be expected here for the same price. There are in America, just as with us, practices in which no jacket crowns can be made, and for the same reason—because no one is able to pay for them. Colleagues of this sort, with a poor class of patients, do not attend congresses, because they cannot afford to stay away from their practice for one single day, as they are unable to pay for a substitute, and . . . because, stunned by this struggle for existence, they no longer are interested in inventions that they will not be in position to use in their practice.

The conditions are identical everywhere, both in America and in Germany, and when speaking of rich America we must not lose sight of the fact that there are across the sea sections of cities of such filth and poverty as surely are not found in Germany. Yet in those sections also there are patients and dentists who have to be governed by the pocketbooks of these patients. On the other hand, there is a wealth that enables the dentists of the golden practices to charge such high fees that they are content with two or three patients a day.

The wealth of the United States is the reason for still another peculiarity of professional practice in the large cities such as hardly exists with us, that is, specialization. Among the practicing dentists, who sometimes number

* A "Kassenzahnarzt" is the official dentist of a (dispensary) union or group, frequently under government or municipal supervision, the workers forming that particular group being compelled to get their treatment from him at fixed rates.

hundreds and more, there are those who only extract teeth, others who only fill, do only porcelain work, etc. That would be inconceivable with us. A specialist who only extracts lower third molars would long ago have starved to death here in Germany, where the number of exclusive exodontists may be counted on the fingers of one hand. But, even though this specialization certainly has some disadvantages, we must not forget one thing, that is, that in the branch in which he specializes the specialist does outstanding work.

It is in this specialization that American dentistry culminates. The work that we saw at the Congress had for the greater part been done by such specialists. Of course, they are paid accordingly. I recently saw a two-piece removable upper bridge that had cost $700.00, and another consisting of seven pieces the price of which was $2,000. With such fees American dentists need not do a great deal of work in order to be able to live. For mere material reasons such specialization is not possible with us.

Limited space, due to high rents, gives the American dental office outwardly an appearance other than we are used to. The whole office consists of an operating chair, cabinet, washstand, stand for the sterilizer and the "unit." The unit includes about everything not yet mentioned: engine, cuspidor, bracket table, connections for hot and cold air, sprayers, light. It is really an ingenious invention but . . . only for America. Here in Germany I do not see why I should take all these appliances from one stem, an electrical connection, like the branches of a tree. We have no need, at least for the present, to have all this apparatus about us and the patient, as we have no lack of space. Such confusion also is often annoying. But that is not the most important thing. The unit is so complicated that one or the other part may break and then the whole apparatus is out of order and cannot be used, not to mention the fact that it will probably not be so easy here to find a mechanic able to make repairs. Another disadvantage, in my opinion, is that the fountain spittoon cannot follow the movements of the chair when the latter is being raised or lowered.

In some respects the unit offers great advantages. Thus, for instance, I liked particularly the feature of the cord for mouth illumination, cauterization, hot and cold air appliances, automatically disappearing into a special compartment. The lighting also is excellent. In this respect there is much room for improvement with us.

To all German colleagues, however, it was no doubt a matter of surprise that the furniture and other equipment of the dental office were not of the purest white, but in color. The greater part of the furniture is of mahogany finish. The American believes that the depressed state of mind in which most patients come to the dentist is due to a great extent by the deterring impression caused by the cold materiality of the operating room. For these psychological reasons the furniture is colored and everything installed with the idea of making it look homelike. They use draperies and cushions in subdued shades, carpets on the floor, and art works in the rooms. I was even told that the phonograph was operated

during treatment, in order to divert the patient's mind. To be sure, I do not know whether music makes an extraction easier; I think oftentimes the contrary is the case. But, as regards the proper arrangement of the operating room, I do not believe that we in Germany can disregard that, as long as our public very properly puts cleanliness and proper arrangement in the same class, not to mention asepsis.

As stated in the beginning, I will not lose myself in particulars and write of only one section. That in America they have materials with which our products cannot compare is only too true. Where there are eight times as many dentists the demand also is correspondingly greater, and where the demand is greater the product can be sold cheaper or, if the price is the same, the quality can be improved. In addition, they have reduced the number of kinds. In Germany, for instance, a gold manufacturer must supply every kind of gold in several karats and colors, because one dentist prefers yellow gold, another gold of a more reddish hue. In America these distinctions are not catered to. So far as I know, one firm sells only six kinds of gold, which have their determined applications and may be combined according to instructions. Just imagine what capital our gold manufacturers have to keep lying idle without drawing interest if they want to keep a stock of 14-, 16-, 18-, 20-, 22-karat gold, and all in different shades! In this respect the American methods undoubtedly could be followed, and I can only welcome the fact that one German firm has recently placed on sale standardized alloys.

I will here briefly touch upon instruction and study conditions in America. They have been extensively described by Fritsch and others, where especially the German teachers, with a secret sense of envy (or have I read wrong between the lines?), looked upon the more school-like way of instruction in America. I do not think that this method of instruction is really so very different from ours, for today a student who wants to get his diploma is obliged to attend classes and clinics regularly. The whole development of instruction after the War in Germany tends to force the student on account of economic conditions to attend all lectures so as to complete his studies as soon as possible and learn as much as possible, because only in this way will he be able to take up the struggle for existence. We are therefore approaching American conditions quite gradually and imperceptibly, and there is no need of introducing compulsory attendance at lectures.

In conclusion, may I say a few words regarding American professional literature, the magazines.* When comparing a German magazine with an American magazine, the reader will at once note that the printing, paper and general appearance are mostly superior to ours. They also contain much more matter, although the price is very low. That is accounted for by the many advertisements, which make it possible to supply the magazine in this form. In this respect also much could perhaps

*I have in mind only those magazines which the majority of dentists really read. We also have magazines well printed, on good paper, with unfortunately a small number of readers.

be accomplished with us by proper propaganda.

As regards the articles in the magazines, they are mostly shorter than ours, dealing with practical subjects or at least subjects which have an application for the practice. Articles of purely scientific character are rare. The small number of histological articles particularly attracted my attention. Most of the articles have a foot-note reading: "Paper read on such and such a day at a meeting of such and such a society." There is a great difference compared with the origin of German scientific papers. With us lectures subsequently published in magazines are rarer. That, I believe, is due to the circumstance that the Americans are much better speakers than we. They begin early at school to practice speaking and continue later at the universities and their many clubs and societies. Although at the congresses we generally hear about a paper being read, there is hardly a speaker who reads from manuscript. Such a lecture, of course, has a much greater effect on the listeners and leaves a more lasting impression than that of the lecturer who must stick to his manuscript.

On the other hand, fault is to be found because so much is published in the American magazines that contains really nothing new nor beyond the realm of the daily practice. The custom also seems to prevail of beginning "ab ovo" before the author approaches his real theme.

Are American conditions, then, worth while in practice, in equipment, in dental instruction and literature? Whoever has seen conditions over there must acknowledge that the expression *New World* is not an empty phrase. The conditions, so essentially different from ours, demand different forms, different attitudes toward the patient. Certainly we can learn a great deal from the Americans, but the Americans also can learn from us. All dental surgery comes from Germany; the German workers take an eminent part in biology, histology, pathology, caries research and jaw mensuration, to mention only a few. The expression *American dentistry* is incorrect. It would be more correct to speak of American *technic,* for that only has a typical character. But, also, that form of technic is first of all suited to America. The American patient swears by his doctor and lets the latter do all kinds of technical work which he considers indicated, whereas in Germany we always meet with resistance when we want to make a removable bridge because fixed bridges are preferred by our patients.

Every dentist must be guided by his clientele, and this applies equally to America. Germany undoubtedly will in the not distant future become Americanized in many respects (surely before the rest of Europe), but this development can be neither hastened nor obstructed—it proceeds spontaneously. With this course of events (I have in mind here the city building in the large cities, raising of rents, etc.), dentistry also will be forced to adopt many things from America. But then we not only shall be the receivers but can render in return research work, experiences and inventions, which America also can use.

Edwin S. Fuller, D.D.S.

1869-1929

Edwin S. Fuller was graduated from Ohio State University at Columbus in 1895 and received a gold medal as the honor student of the college.

He was a member of the Dayton Dental Society, Ohio State Dental Society, and American Dental Association.

He practiced in Troy and Piqua, Ohio, and in 1914 moved to Dayton, where he established a selective practice.

He had been ailing for about a year and was operated upon last June, but the seriousness of the case prevented the completion of the operation.

Few men in the dental profession have had more scientific minds than Dr. Fuller. He had a clear vision and was a diligent student. He cared nothing for social affairs, but arose every morning at four to conduct his experiments and to read.

Coupled with this, he had marvelous ability as a practical dentist. He was one of America's finest operators, and his ability never failed him up to the moment he had to give up his work.

His studies comprised all scientific subjects. He was so modest that only his closest friends could draw him out. He studied for study's sake. If it had not been for his modesty and retiring disposition, the profession at large would have benefited more from his learning. No one was admired more than he by those who knew him. He kept to his high ideals up to the last.

During his illness his mind was very active and he kept it occupied so thoroughly in reading and making notes covering a variety of subjects that he was able to ignore and put aside most of the pain.

For many years he had compiled exhaustive notes relating to his profession and to his travels and hobbies.

He might be considered one of the pioneers in the art of making porcelain jacket crowns. His notes on the working of porcelain are valuable. He intended to embody them in a book.

His jacket crowns were works of art as to both workmanship and coloring. He had made a deep study of the problem of shading porcelain so that, as far as he was concerned, he could accurately reproduce any color he desired.

The profession loses one of its most valuable members.

Resolutions on the Death of Victor Hugo Jackson, M.A., M.D., D.D.S., F.A.C.D.

Whereas, The New York University College of Dentistry has suffered the loss, through death, of its Clinical Professor, Dr. Victor Hugo Jackson; and

Whereas, The deceased had been a

pioneer in the field of orthodontia, retaining through a long and active career a position of leadership among his fellow-workers, and who, to the end, remained an indefatigable worker and educator, maintaining the highest standards of the profession and serving as a source of inspiration to his younger followers; and

Whereas, In his demise the dental profession, as well as all humanitarian movements, has lost a man who gave unstintingly of the best that was in him for the relief of the suffering and for the uplift of all mankind; therefore be it

Resolved, That the Faculty of the New York University College of Dentistry expresses its deep sorrow at the loss of its fellow educator and friend; and be it further

Resolved, That these resolutions be recorded in the minutes of the Faculty and a copy conveyed to the family of the deceased as evidence of its sympathy.

For the Faculty:

Edward M. Griffin,
Abraham Lees,
Egon Neustadt.

DIGESTS

THE PREVENTION OF DENTAL CARIES

By Russell W. Bunting, D.D.Sc., and Others

It has been found that in certain individuals there is an immunity to the growth of B. Acidophilus, though this immunity may disappear at intervals and return again. During the period of immunity the B. Acidophilus will not become implanted in the mouth, no matter how large a quantity may be ingested.

A large group of children were given a well-balanced diet with, as far as possible, sugar and candy eliminated. These children developed normally and the growth of B. Acidophilus and the incidence of caries were markedly reduced.

It has been found that the topical application of metaphen by the dentist after oral prophylaxis and the use of hexylresorcinal (S. T. 37) by the patient as a mouth-wash will be of great assistance in controlling caries.—*The Journal of the American Dental Association,* February, 1929.

THE DENTAL ASPECTS OF A CASE OF DWARFISM

By G. Lansing Taylor, D.D.S., and J. L. T. Appleton, Jr., B.S., D.D.S.

The patient was a woman of Italian parentage, 20 years of age, 37 inches in height, and 38 pounds in weight. There were no signs of abnormality until the age of six months when, after a supposed attack of whooping cough, she ceased to develop as other children. Treatment with thyroid extract produced some improvement.

All the permanent teeth were present, though some of them had not erupted. Many were atypical in shape, and the surface markings showed signs of imperfect enamel formation. Certain of the teeth were malposed and, taking the dentition as a whole, there was marked malocclusion. Caries and calculus were present, though not to any unusual degree.

The malocclusion of the teeth was probably due to the prolonged retention of the deciduous teeth, which is a characteristic of this disease.—*The Dental Cosmos,* February, 1929.

THE USE OF AMMONIACAL SILVER NITRATE AND FORMALIN

By J. W. Woodle, D.D.S.

The author has found this of great value as an aid in the treatment of pyorrhea, since it thoroughly sterilizes the pocket and the cementum of the tooth.

The pocket is first flushed out with sterile water and dried and then swabbed with chloroform. Ammoniacal silver nitrate is placed in the pocket and allowed to stay for ten or

fifteen minutes. The excess is removed with cotton points, and the formalin is applied. The silver nitrate is again applied in smaller quantity and for less time and is then followed by eugenol. Glass applicators are used for applying the solutions.

This treatment will change a septic pocket and root into an aseptic one. The bacteria are destroyed, there is relief from irritation, and the flow of pus ceases.—*Dental Items of Interest,* February, 1929.

THE BACTERIAL DESTRUCTION OF DENTAL ENAMEL

By CHARLES F. BODECKER, D.D.S., F.A.C.D,. and HENRY W. C. BODECKER, B.S., D.D.S., D.M.D. (Germany)

W. D. Miller described the process of carious destruction of the dentin. It is first decalcified by the action of an acid and then the organic substance is destroyed by the proteolytic action of bacteria.

The formation of mucigen plaques, containing chiefly the B. Acidophilus, is the initial step in caries of the enamel. These form lactic acid, which decalcifies the enamel to a slight depth. Cocci, probably diplococci or streptococci, exert a proteolytic action on the matrix of the enamel. The action of the lactic acid and the action of the cocci alternate and the enamel is soon penetrated.

Since the bacteria show a certain amount of selectivity by destroying the contents of the enamel rods more quickly than the enclosing sheath, it would appear that the two structures differ chemically. The authors believe that the sheath is composed of keratin and the rod of calcified protoplasm. This would suggest that enamel is a calcified tissue.—*The Journal of Dental Research,* February, 1929.

Foreign Dental Literature

LOCAL ANESTHESIA

By GUIDO FISCHER, Hamburg, Germany

In this article Fischer lays stress on a sterile solution, a sterile instrumentarium and a careful disinfection of the site of the needle puncture. The solution itself must be isotonic, and he warns that any deviation may result in untoward consequences.

He speaks of tutocain, which has been praised by several investigators, although it is two and a half times more toxic than novocain. Fischer still uses novocain and for him it is supreme. There has not appeared as yet any remedy for novocain dermatitis.

A careful study of the effect on the pulp during anesthesia with novocain has been made by Hellner. He summarizes his findings as follows:

Novocain suprarenin solutions produce a strong venous and arterial hyperemia. This produces rupture and exudation of blood into the surrounding pulpal tissue. There is produced an edema in the pulp, especially in the horns. In isolated cases there even occurs a death of some of the odonto-

blasts adjacent to the dentin. He has found that pulps with open foramina suffer less than those with normally closed foramina. A strong solution of novocain has no more harmful effect on the pulp than a weak solution. It is definitely proved that it is absolutely safe to use novocain in conservative dentistry, and Fischer says that not a single case has come under his notice where a pulp has died after an injection. In those instances where novocain is used prior to the removal of the pulp he has found that the periapical tissue is far more healthy than when arsenic has been used.

Fischer is definitely opposed to the ampoule system, in that the contents are not isotonic. As proof he shows that only 9% of cases required after-treatment when the usual novocain solution was used, but that 32% of cases injected from ampoules needed after-treatment. He says further that something has been added to the ampoule to keep the suprarenin from breaking down, with consequent injury.

The ideal hypodermic syringe is one that can be taken apart instantly and boiled.

He suggests a 5% solution of cocain with which to paint the site of the needle puncture, for avoiding pain, or a 5% solution of cocain in trypaflavin (1.1000), which will in addition sterilize the mucosa.

Fischer emphasizes that local anesthesia should be carried out without pressure and attributes most after-pain to injecting beneath the periosteum.—*Die Fortschritte der Zahnheilkunde,* January, 1929.

GENERAL SUMMARY OF THE ETIOLOGY OF CARIES

By Gosta Westin

The author speaks of the various theories of caries from earliest times, coming finally to the recognized research of Miller, who advanced the parasitic and chemical factors as the true cause of caries. James E. Garretson, as far back as 1869, wrote: "Caries of the teeth is a chemico-vital action and most markedly a trouble of hereditary transmission and predisposition."

The writer quotes Tomes also, who said that the teeth are a part of the human picture, and that every tooth destruction is reflected in the health of the individual.

The statement also is made that, strangely enough, people who give great attention to the prophylaxis of the mouth with the toothbrush and tape nevertheless have caries, while others who have never known mouth hygiene have perfect teeth.

The following conclusions are reached by the author:

(1) The tooth is, during its entire life, a living organism of such nature that it takes part permanently in the health of the individual and can be influenced by the health of the individual.

(2) The enamel is a living tissue, whose vital functions are made possible through the pulp, by way of the dentin and odontoblasts.

(3) The pulpless tooth is not necessarily a dead tooth. The hard substance can be nourished through the pericementum through the cementoblasts and cementum.

(4) The tooth organ is a protoplasmic mass in which all the boundaries between different tissues, hard and soft, are to be regarded as fiction, which we have set up ourselves.—*Vierteljahrsschrift für Zahnheilkunde,* No. 44, 1928, Vol. 4.

PULP AMPUTATION OF TEETH NOT FULLY DEVELOPED

By IMM. OTTESEN and K. HAUPL

Great interest has been shown in the amputation of pulps, first introduced by Witzel in 1872. Many authorities use a caustic such as arsenic before amputating the pulp, while others perform this operation under a local anesthetic on the live pulp. Certain drugs are used to cover the stump of the remaining pulp. This operation is specially indicated in multirooted teeth where there is unusual difficulty in removing the entire pulp tissue. It should not be attempted where there is an infected or necrotic pulp.

The histologic changes following pulp amputation have been studied, and many interesting microscopic slides are reproduced in this article. In general it is shown that necrosis of the remaining pulp tissue is the rule, following the use of a caustic. It is definite that arsenic must not be used prior to pulp amputation. Very recently Dr. Wirz amputated the apices of fourteen teeth which had previously been subjected to pulp amputation. A period of ten to twenty months was permitted to elapse between pulp and root amputation. In the earlier cases Wirz found no secondary cement, but did find the periapical tissue changed and infiltrated with round cells. He saw also a direct growth of peridental tissue cells into the apical foramen, which caused enlargement of the canal and resorption of the devitalized pulp tissue.

Two cases are carefully described in which pulp amputation was performed on children, each seven years of age. The first molar in each case showed incompletely calcified root apices with the canals wide open. In one instance arsenic was used for the first twenty-four hours, the pulp amputated, and the tooth sealed. In the other instance the pulp was amputated under local anesthesia and the same procedure followed. This was in 1922. The authors then show radiograms taken six years later, and there can be no question that the teeth appear normal, and that the canals at the apices have closed. Furthermore, the teeth, having broken down, were removed and cultures taken of the contents of the apical portion of the root canals showed absolute sterility.

Briefly, the technic consists in the amputation of the pulp. The stump is sprinkled with iodoform powder, and a bit of cotton dipped in camphophenique is placed in the pulp chamber and sealed with a temporary cement. After two weeks this is removed and the following paste placed in the pulp chamber:

Iodoform	
Zinc oxide	aa 1.0 g.
Thymol	
Aristol	aa 0.1 g.
Glycerine	q.s.a.t. paste.

This paste is covered with cement.

SUMMARY

In cases of teeth with incompletely calcified roots where root-canal work is necessary, it is best to amputate the pulp under local anesthesia with absolute asepsis. The pulp stump is to be covered with a non-caustic iodoform paste and then a zinc cement and a metal filling. The use of arsenic for devitalization and of especially strong caustics is to be avoided. Sharp instruments should be used to keep from crushing the remaining pulp tissue. There is no further growth in the length of the roots. This treatment in gangrenous pulps is contra-indicated. As a result of a correct technic, the new connective tissue takes the place of the pulp tissue, and through the deposition of secondary dentin the root canal is narrowed to normal proportions.—*Vierteljahrsschrift für Zahnheilkunde,* No. 44, 1928, Vol. 4.

[BUSINESS ABILITY NOT EVERYTHING]

There has been perhaps a fluctuating attitude of dentists toward the purely business side of the profession. The taint of commercialism has been to all intents and purposes disassociated. There still lingers, however, certain features from which the profession has not been entirely divorced. There have been and still are many outside influences which urge the dentist to change his old office equipment for new arrangements and elaborate office fixings, for highly polished de luxe equipment and time-clocks. These may be essential in keeping up with the progress of the day, but the dentist should be alert to his necessities and at the same time recognize that material things are not substitutes for skill, knowledge and efficiency.

—BEAR.

PRACTICAL HINTS

THIS DEPARTMENT IS NOW BEING CONDUCTED FROM THE OFFICE OF THE DENTAL DIGEST. TO AVOID UNNECESSARY DELAYS, HINTS, QUESTIONS AND ANSWERS SHOULD BE ADDRESSED TO EDITOR PRACTICAL HINTS, THE DENTAL DIGEST, 220 WEST 42D STREET, NEW YORK, N. Y.

NOTE—Mention of proprietary articles by name in the text pages of THE DENTAL DIGEST is contrary to the policy of the magazine. Contributions containing names of proprietary articles will be altered in accordance with this rule.

EROSION.—I could not help writing you regarding erosion or, as I see it, attrition. I have had numerous cases, some of over twenty-five years' standing. My attention was called to my sister's case nearly thirty years ago and I had her use a camel's-hair brush and a bland paste. The centrals and cuspids especially were cupped very badly and were sensitive. Today these surfaces are highly polished and not sensitive.

According to my idea, a real camel's-hair brush, which may demand more brushing, will right these cases without filling. Most people use a brush that is too stiff and expect results (cleansing) in a few moments, and abrasion takes place. Milk of magnesia is also good for erosion, which means an acid reaction in nearly all mouths. Litmus paper will tell that.

We as dentists lay too little stress on what should be used in the mouth after we have finished. Even after prophylaxis we do not tell patients what should be used in their case. Patients complain at times of certain fillings tasting, when it is a systemic fault.

We do not go into cases deep enough nor take enough interest in our patients.

A. E. THOMPSON, D.D.S.

Editor, Practical Hints:

I have a case that is causing no small amount of grief, and if you can help me, it will certainly be appreciated. The patient is wearing a plate which is perfectly comfortable, and which is absolutely stable in all positions. It is possible to bite an apple or eat corn on the cob. However, after the plate has been in place one or two hours it loosens up, has a great amount of saliva under it and is not stable at all. Washing off the plate restores the fit.

I have postdammed, rebased, remade and extended the plate, but to no avail.

E. M. W.

ANSWER.—It is evident from your description that there is a slow leak at some point on the periphery of the denture which permits the saliva to enter. When enough has accumulated, the adhesion is destroyed and the denture drops.

This leak may be due to a lack of adaptation or there may be some hard

spot that needs relief. It is very hard to give a diagnosis on a case like this from a distance.

Editor, Practical Hints:

Please advise me as to the best course to pursue with the following case:

A girl, 17 years old, has all of her teeth and good articulation. The left central was devitalized and the canal filled. The left lateral was devitalized and shows absorption of the apex. The lateral has been filled with synthetic porcelain.

Should an apicoectomy be performed, or would it be better to extract the lateral?

F. J. R.

ANSWER.—In a patient of this age it would certainly be better to try to save the lateral. It should be treated and filled and then, if necessary, apicoectomy can be attempted.

If everything else fails, extraction can be resorted to. It is assumed that the patient is in good health and has no systemic involvement.

Editor, Practical Hints:

What is the best and permanent treatment for an erosion cavity in an inaccessible place, such as between molars, the erosion extending beneath the gum?

T. M. T.

ANSWER.—The best way to treat an erosion cavity between two molars is to fill it. Make a compound cavity of it and use a gold inlay. Unless the cavity is obliterated, there will be danger of food packing in, causing inflammation and possibly pyorrhea.

Editor, Practical Hints:

A patient, male, about 35 years of age, suffers from pyorrhea, the lower molars being looser than the upper. The rest of the teeth are not loose. He has a dull pain intermittently once every day or every other day, and he cannot locate it. Nothing initiates the pain, but it comes all of a sudden. He does not mind the pain so much as he does the pyorrhea.

There is no history of a constitutional disease, so far as he knows. There is no recession of the gums There is a very deep pocket on the upper second molar, which is very loose. He takes no drugs.

Regarding diet, he eats plenty of fresh fruits, plenty of salty foods, white bread, salad once every other day, and no milk.

What treatment would you institute to render his teeth firm?

T. M. T.

ANSWER.—The first thing to do is to scale the teeth carefully, removing all deposits and dead tissue from the pockets.

The second is to relieve any traumatic occlusion which may exist, not only when the teeth are in occlusion but also during the various movements of the mandible.

Editor, Practical Hints:

I am seeking information regarding a little girl three and a half years old. She is of normal weight, very active, and appears to be in excellent health.

But the gums are badly swollen, both upper and lower, and pressure on the labial as well as the lingual causes pus to exude as in a chronic case of periodontoclasia. This is the case around every tooth. All of the deciduous teeth have erupted and are free from caries. Occlusion is normal, and the teeth have no calculus but some stains.

Systemically the child has a record of having poor resistance to infections, but her diet is good and the physician can find nothing the matter with her. Since receiving the report from the physician I have been treating the condition as if of local origin, but I have had only partial success. I have used antiseptic mouth-washes and local applications of pyorrhea astringents. After two weeks the blue, congested look and the swelling are slightly better, but the incisors are very loose and pus is still around every tooth. What can I do? The child's tonsils are very bad, but the physician will not remove them until the mouth condition is healed.

I might add that there are no Vincent's organisms present. Except for the swelling in the gums, it looks very much like periodontoclasia, but does that occur in a child so young?

P. W. W.

Answer.—I believe that the case you mention is not of local origin but the manifestation of some systemic condition. The diet, however, may be of such consistency that the gums are not receiving sufficient stimulation. It is possible that the infection is coming from the tonsils.

A consultation with the physician would seem to be advisable.

Editor, Practical Hints:

I should like to ask if you know of any way, other than cutting it out, of taking a spot of maroon rubber out of the pink in a vulcanite plate where it has worked through.

A. L. L.

Answer.—In a case of this sort prevention is the thing to strive for. The only known cure is to cut the spot out.

Editor, Practical Hints:

The patient is a lady, 33 years old, suffering from no symptoms whatever. Her mother died from diabetes, and this patient had it about two years ago but now is free from all symptoms. Her dental work has been done in New York and is very beautiful work. Both of the teeth of which I am sending the pictures are abutments for very fine removable bridges.

I am always undecided as to what to advise under circumstances of this kind, for, as I told you, she has no symptoms of focal infection, and yet those teeth certainly do not look good.

F. H. H.

Answer.—It is evident that there is or has been a disturbance at the roots of these teeth, but whether or not there is an active infection at the present time it is impossible to say.

It would be rather unwise to condemn a beautiful—and expensive—prosthetic appliance simply on the evidence of the x-ray, especially since there are no systemic symptoms. The patient should be advised of the findings and should have the area x-rayed at intervals as a check on the conditions. If

the diabetes should return, then a consultation with her physician would be advisable.

Editor, Practical Hints:

I do quite a lot of full denture work, and in adjusting the articulator to the protrusive and lateral condylar relationships, transferred from the mouth, I often get a minus reading of the condyle paths on both sides and occasionally a plus reading on one side and a minus reading on the other side.

Now, some men tell me that they have never found this condition and believe it is so rare that it is almost impossible to have this condition in the mouth. They believe that my findings have been due to faulty technic in obtaining the relationships.

The case I have on hand at present shows -35° on the right side and -15° on the left side. I checked this three times and obtained the same relation each time. Furthermore, the dentures apparently articulate in the mouth exactly as on the articulator.

Do you find this condition to be common or rare? If my technic is faulty, what factors would contribute to my error?

E. G. T.

ANSWER. — The error doubtless comes from a faulty technic. We advise a more careful adaptation of the baseplates in the mouth so that there will be no shifting during the various movements, and we also recommend the use of a face bow so that there will be an extra-oral check on the different registrations.

Editor, Practical Hints:

Frequently patients show a decided acid reaction to the litmus-paper test of saliva. Kindly advise me as to what condition produces this change, the effects on the oral cavity and the systemic prognosis and treatment.

T. C. S.

ANSWER.—Saliva in the normal individual is supposed to be alkaline, but to such a slight degree that variations have little significance. The composition of saliva depends on the rapidity of the flow, and its organic and inorganic contents are primarily the secretions produced by the nature of the stimulant.

The alkalinity of the saliva depends directly on its ash content. With an increase in the rapidity of flow there is always an increase in the alkalinity. Furthermore, the quality of the saliva when collected during active digestion is always an expression of the nature of the last meal taken. Consequently you see the unreliability of a litmus-paper test. Prinz states that the only scientific method is the electrometric measurement of the H-ion concentration, using saliva that has been collected during the resting hours of the digestive apparatus.

Unless the examination of the saliva is correctly made, any diagnosis, prognosis or treatment based on it is very apt to be wrong.

DENTAL ECONOMICS

Investments For Dentists

By WALTER S. KYES, D.D.S., San Diego, California

First Article

The average young dentist's knowledge of investments is little more than that possessed by the high-school graduate, which has primarily to do with the cost of sweaters and tennis rackets. This is not to be wondered at for the simple reason that anything like the kind of intensive training that deals with investments is dealt with in departments of educational work which, unfortunately, do not come within the scope of a dental education.

After graduation from high school the young student either takes up the so-called pre-dental or pre-medical course or at once enters the dental college. In either case he deals almost exclusively with the arts and sciences, his ignorance of the subject of investments remaining quite undisturbed for the time.

The present aim of dental colleges appears to be that of fitting the young dentist to render dental service to the public. Of course it is assumed that he will receive a more or less adequate remuneration for such service, but just what will eventually become of this remuneration is left entirely in the hands of him who earns it. When we consider his lack of business training and consequent lack of business acumen, it is a most pitiful situation in which the young dentist finds himself. He may not realize this at the time, but eventually he will learn—maybe to his sorrow.

The foregoing statements are made from knowledge gained in the observation of dentists' methods of investment and the amount of money which they lose through speculation. Perhaps the colleges are not to blame—it may be that an appeal has never been made to them to right this wrong in our educational methods—but the wrong exists and its possibilities are tremendous. Hence it appears to be the joint duty of organized dentistry and college faculties to take steps to see that the young men entering our profession are prepared to invest with safety a part of the money which colleges so earnestly endeavor to prepare them to earn.

It might be well to clinch this argument at once by means of a specific instance that came under the writer's observation. In a certain office building, in a certain city, he knows that no less than the sum of fifty thousand dollars was taken from dentists on two floors of that building by means of fraudulent promotions within a period of five years. Of course there are myriad buildings, each containing from two to twenty or more floors, occupied by thousands of dentists, all of which information is available to any one who

wishes to compile statistics. There is no question that in regard to our financial affairs we as a profession need help.

With this thought in mind the writer has prepared a number of articles which, through the courtesy of THE DENTAL DIGEST, he will from time to time offer to the dental profession, in the hope that they will make an appeal at least to the young men just entering our profession and perhaps put them on their guard so that conservatism in their investments may enable them to enjoy at some future time the fruits of their labors. The subjects taken up in the articles will out of necessity be discussed but briefly and simply, the object being to make them readable and profitable to the reader.

The first concern of the young dentist is, of course, that of rendering the best possible service to his patient. His second concern should be to collect a certain sum of money as a fee for the service rendered, which fee should net him a profit. If it does not, he should raise his fee or cut down his expense, or both. His net profit will represent his savings, and, as his savings accumulate—which they should do steadily—his next concern should be as to how he can safely invest them. In view of the fact that one cannot with profit invest a few dollars per month, it is well to start a savings bank account until the fund is large enough to be invested. In order to save, one must practice self-denial. The average dentist, with the cooperation of his wife, can sit down and figure out without conscious effort where they can spend from one hundred to five hundred dollars for various things which they feel they need, hence the necessity for self-denial. Systematized saving, it will be found, consists chiefly of doing without the things which one would like to have and would like to do, but which are not positively essential.

There is one particular thought to keep in mind when investing money, that is, that *the bigger the earnings promised, the greater is the risk involved.* Another thing should be obvious to the person who is looking for investments, which is, that he cannot afford to emulate the man who has unlimited means.

To the dentist who is at the head of a household, or who has dependents, life insurance offers one of the best and one of the safest investments. If taken out in a well-established company, it is relatively safe. It offers a fair rate of interest on the money invested and affords protection for dependents as well, and after a term of years the policy may be cashed in and the proceeds used for other purposes. Life insurance has a tendency to compel the insured to save, no matter how prodigal his habits may be. The insured must pay his premiums or lose out altogether. Five hundred dollars in a savings bank would net one's dependents $520.00 at the end of a year. One hundred dollars invested in life insurance, in case of the demise of the insured within the year, would net his dependents something like $2,000. The value of insurance is thus made obvious.

On the other hand, it is the writer's opinion that if a person cannot save money except through such forced saving, he should not encumber himself with too much life insurance. From

five to ten thousand dollars should be sufficient to begin with. It is also advisable, in these times made extra-hazardous by street and highway traffic, to carry accident insurance and possibly sick-benefit insurance as well, but in no case should one put all of one's eggs in one basket, so to speak. The writer has just cashed in on a policy taken out twenty years ago. To every dollar that he put into the policy previous to 1915 he has now to add an additional sum of seventy-one cents so that the dollar may purchase as much as it would have purchased when it was put into the insurance policy—hence the egg argument.

The argument has often been advanced that the leaving of large sums of money to one's heirs is not advisable because of the inability of the recipients thereof to invest such funds wisely. The argument is well founded, because a large majority of women have little knowledge of values or of the methods of conducting business transactions, and it is almost certain that after coming into the possession of money one's dependents will at once be besieged by all sorts of stock and bond salesmen whose main object it will be to separate them from their money. In fact, it is not uncommon for sellers of securities to make well-organized and intensive drives against the unwary through the medium of high-powered salesmen with the foregoing object in view. The monthly-payment insurance policy for a beneficiary is an effective safeguard against such losses, in that it contracts to pay a certain sum monthly to the payee during his or her life, the residue going to the legal heirs after the death of the payee. For the reasons set forth above, this is an admirable arrangement and such a policy should have the careful consideration of the person who contemplates taking out an insurance policy.

Stringent state laws have almost, if not quite, eliminated the "trick" insurance salesman, and today, when one does business with the representative of an old and well-established insurance company, one does it, as a rule, with a thoroughly honest and capable business man. This situation has largely eliminated items of chance in the insurance business. However, if one is not familiar with the company or with the policy it offers, one may procure all of the necessary data from any one of a half-dozen sources within a few hours or days at least. In carrying on these investigations the prospective purchaser of insurance, stocks, bonds or whatnot can of course get assistance from reliable sources. In so doing he should seek *information* rather than *advice,* and he should learn to distinguish between the two. If the information which he receives is not clear or is inadequate, the purchaser should postpone his transaction until his information is clear, adequate and thoroughly understood. If he finds that the financial intricacies involved are too complex for his understanding, he should deal in more simple commodities. The thing to keep in mind while making any kind of purchase is the *value* of the thing being purchased, remembering always to *investigate before investing.*

812 Watts Building

DENTAL SECRETARIES and ASSISTANTS

Secretaries' Questionnaire

All questions and communications should be addressed to Elsie Pierce, care of THE DENTAL DIGEST, 220 West 42d Street, New York City.

NOTE—HAVE YOU A BETTER WAY? HAVE YOU A TIME-SAVING SHORT CUT? DO YOU KNOW A "STUNT" THAT LIGHTENS THE WORK OR MAKES FOR EFFICIENCY IN THE OFFICE? IF SO, WRITE TO ELSIE PIERCE, CARE THE DENTAL DIGEST, 220 WEST 42D STREET, NEW YORK. YOU MAY HELP A NUMBER OF GIRLS WHO ARE JUST BEGINNERS—AND YOU KNOW HOW YOU NEEDED HELP DURING YOUR FIRST FEW MONTHS IN A DENTAL OFFICE. OR IF YOU NEED HELP NOW WRITE TO ELSIE PIERCE—SHE'LL HELP YOU.

Dear Miss Pierce:

I am new in the dental office, and I should like to know how to clean saliva tubes. The doctor saves all his dental books, but I cannot find an article on tubes.

I enjoy reading your articles very much and only wish that your Questionnaire were longer.

E. F., Cicero, Ill.

ANSWER.—Place the saliva tubes in a pan of water with a tablespoonful of washing powder or a teaspoonful of washing soda, bring to a boil and allow to boil for a few minutes or sufficiently long to soften up and loosen the particles adhering to the inside of the tubes. Then, with a pipe-cleaner, clean out the tube of any particles remaining therein, place in clean water, to which you can add bicarbonate of soda or borax, and boil again, rinsing in fresh distilled water. Wrap in a sterile gauze napkin and place in the reserve chamber of the sterilizer or in a covered glass dish, and, when ready to use, wipe off with pure alcohol. The pipe-cleaners may be obtained in any store or shop selling smokers' articles, cost from five to ten cents a package, and come in various sizes. Select the size which will suit your purpose best. In some offices the tubes after cleansing are kept in covered receptacles containing a formaldehyde solution or campho-phenol.

Dear Miss Pierce:

I should like to offer the following suggestions to W. R. S., Pleasantville, N. Y., regarding sterilizing syringes:

I think that the use of the antiquated syringe with glass or metal barrel is well-nigh inexcusable, therefore urge your dentist to equip himself with two ampoule syringes, one of one c.c. and the other of two c.c. capacity, with a generous supply of ampoules for each syringe. After using, dismount the needle and hub, remove the empty ampoule, place the syringe in the sterilizer and boil; then wipe with a piece

of cotton and alcohol, replace the wire in the needle and lay in a covered porcelain or glass dish. I always dip the needle in alcohol before using, burning the alcohol off before injecting.

Do not use needles too long, for it is poor economy. At the first sign of weakening or the first speck of rust, throw the needles away.

Dr. O. H. B., Las Cruces, N. M.

We appreciate these suggestions and thank Dr. O. H. B. for his interest.

Dear Miss Pierce:

I should like information regarding courses for dental hygienists. I am at present employed as a dental assistant and enjoy my work, but I wish to broaden my knowledge on this subject and take some courses in it. I cannot very well afford to give up my position in order to attend day school, but I should like very much to take evening courses. Are there any evening courses in New York that I can attend?

I am a constant reader of your fine column in The Dental Digest and have recommended it to several others in the dental profession.

S. J. W., N. Y.

Answer.—For information regarding the courses for dental hygienists given in New York apply to the School of Hygiene, School of Dentistry, Columbia University, Dr. Anna V. Hughes, Director.

We know of no evening courses here in dental hygiene.

We thank you for your words of commendation regarding our department and are glad to know that it has been of assistance to you. If you will look up the back issues covering a period of several years, you will find much therein that will broaden your knowledge on the subject of the dental assistant and her work.

Dear Miss Pierce:

I am writing for help in removing x-ray developer stains from my shoes. I spilled a bottle of developer, and it has practically ruined my shoes, which are of leather.

K. I., Binghamton, N. Y.

Answer.—We take it for granted that your shoes are of white leather, as you do not mention color. We have never tried the following method on shoes, but know that it works well with uniforms of white material:

Use a solution of oxalic acid or acetic acid in a 5% strength, applying it to the stains and allowing it to remain for about two minutes, then washing off with clear water until you are certain that the acid has been removed. Follow with the application of a saturated solution of bleaching powder (calcium hypochlorite) and allow to remain for ten minutes, then wash this off thoroughly with clean water. If after this treatment the stains have not entirely disappeared, try over again from the beginning.

Stains produced by the fixing solution can be removed with soap and water.

We trust that this will solve your problem and should like to know if it has been successful, for, if it has not, we will endeavor to secure other information on the subject.

Dear Miss Pierce:

I wish you would say something in

the department about personal hygiene, and how important it is for the assistant to be most particular in this respect and to know how to approach a patient on the subject, which is rather a delicate one. Strong perspiration odors are very offensive and often not noticed by the person affected. J. W., Iowa.

ANSWER.—For the correction of strong and unpleasant personal odors the general health of the individual must be considered, and it is important to give careful attention to the excretory functions of the body. Elimination and intestinal stasis may be at fault, or there may be a kidney disturbance. If the assistant will broach this idea to the patient, it will afford the opportunity to mention personal hygiene for the elimination of unpleasant body odors without approaching it from a personal angle. For the intestinal condition and kidneys the family physician should be consulted and his advice strictly followed.

There are many products on the market for the correction of malodorous perspiration, but they do not touch the source, and the use of perfume is only covering up one odor with another.

Proper cleansing of the skin is essential. The body should be well lathered with a good pure soap, the lather allowed to remain for a short time and then rinsed off with hot water, followed by a cold sponge or shower. Internal bathing should be indulged in. The feet should receive attention, as they are often troublesome. They should be bathed twice a day, if necessary, and a solution of boric acid used as a lotion, with a reliable dusting powder in the shoes and stockings each morning.

The slogan against offensive body odors might well be *Cleanliness* inside and out.

EDUCATIONAL AND EFFICIENCY SOCIETY FOR DENTAL ASSISTANTS, FIRST DISTRICT, NEW YORK, INC.

The Educational and Efficiency Society for Dental Assistants, First District, New York, Inc., held its regular meeting on March 12, 1929. Dr. W. B. Dunning gave a very interesting talk on *Office Management* and brought to the members many helpful hints for service in the dental office. *Periodic Health Examinations* was the topic of Dr. Joseph Alexander of the New York Tuberculosis and Health Association, in which he gave much practical and sensible advice for the maintenance of health.

The Clinic Club held its meeting at the office of Dr. B. W. Kirschner, 109 West 57th Street, New York, on Monday, February 18th. One of the members, Madeline Moehler, gave a practical demonstration of the Secretarial Section of the Club, showing methods of bookkeeping, filing systems, recording, collection cards, recall cards, follow-up letters, etc., which aroused great interest and brought forth many useful hints from the members attending.

The class in First Aid is in full session and is proving of great interest to those who are taking this means of adding to their knowledge along this particular line.

The eighth annual dinner of the Society will take place on Saturday evening, May 4th, at the Hotel Astor. The committee in charge, Martha Hall,

Chairman, is planning special features for the occasion.

The Society meets regularly at the Academy of Medicine, 2 East 103rd Street, New York, on the second Tuesday of each month, October to May, inclusive. A cordial invitation is extended to all members of the dental profession and to their assistants. Ethel Meyerson, 27 West 86th Street, New York, Chairman of Membership, will be glad to furnish further information.

Montreal Dental Assistants Association

The Montreal Dental Assistants Association held its February meeting and Clinic Class at the Dental Faculty of McGill University. Miss E. Moye, president, was in the chair. Dr. Campbell Morris, Demonstrator in the McGill Dental Faculty, spoke on *Dental History.*

[CARE OF CHILDREN]

If there is ever a time in the human span of life that care should be of the highest precautionary type as regards focal infections, it is during childhood. Therefore, all operative procedures should be made with that thought in mind. Health and its preservation is the highest duty of our profession, and every effort should be tempered with that standard in mind.

—Rhobotham.

BOOKS RECEIVED

A BOOK MAY BE AS GREAT A THING AS A BATTLE—DISRAELI

Your Teeth, by Charles I. Stoloff, D.D.S.

This is an attempt by the method of questions and answers to educate the layman in regard to his teeth, their ailments and the methods of treating them. This is the third book of this kind that has been published within the past few years, but it is more pretentious and thorough than its predecessors.

Too much misleading propaganda has been put before the public by various manufacturers, and reliable information from professional sources is most welcome.

224 pp., with 37 illustrations. New York: E. P. Dutton & Co., Inc., 1929. —A. M. J.

The Principles and Technique of the Removal of Teeth, by Adolph Berger, D.D.S., Associate Professor of Oral Surgery, School of Dental and Oral Surgery, Columbia University; Chief of Clinic, Oral Surgery Department of Vanderbilt Clinic; Oral Surgeon to the Hospital for Joint Diseases; Oral Surgeon to Beth Israel Hospital.

It seems almost superfluous to review a book by Dr. Berger, as his reputation is so widespread. Having already written a book on oral surgery, he has now turned his attention to the extraction of teeth and it is refreshing to find a volume devoted to that subject alone.

The general practitioner is always faced by the possibility of having to remove teeth and to him this book will be of great value. The various operations are thoroughly described and clearly illustrated. The chapters on postoperative care and dry socket will be found of special interest.

For the specialist the technic of removing impacted teeth, lower third molars and cuspids might be studied with profit.

On the whole, this is an excellent book. The illustrations are perfectly reproduced and the presswork is of the highest order.

346 pp., with 269 illustrations and index. Brooklyn, N. Y.: Dental Items of Interest Publishing Co., Inc., 1929. —A. M. J.

Care of the Mouth and Teeth, by Harvey J. Burkhart, D.D.S., LL.D., Director, Rochester Dental Dispensary, Rochester, N. Y.

This booklet is the newest of the National Health Series and in a brief and rather sketchy manner undertakes to inform the laity in regard to oral conditions and their care.

45 pp., with illustrations. New York: Funk & Wagnalls Company, 1928.—A. M. J.

EXTRACTIONS

No Literature can have a long continuance if not diversified with humor—ADDISON

We don't know a millionth of one per cent about anything.—*Thomas A. Edison.*

(Professor)—You say your ancestors were great linguists?

(Student)—Yes. One of them was interpreter at the Tower of Babel.

Said Cal. to Herb.—"If you get an electric horse keep it secret, otherwise you'll never hear the last of it."

An Efficiency Expert

The fellow who sets two alarm clocks. One of them wakes him up at six fifty-five so that he'll hear the one at seven.

One of the newspapers reports the case of a flapper who, being annoyed by a book agent, was advised to go after him with a broom!

"But what's a broom?" she asked.

A Case for Duplicate Dentures

A Scotchman and his wife entered a restaurant and he ordered one sandwich. He carefully cut it in two and started to eat. His wife sat waiting. The waiter asked her if she wanted anything? To which she replied: "Jock's using the teeth. When he finishes I'll eat my half."

"I'd like to buy a petticoat," said a young woman, somewhat hesitatingly.

"Antique department on the third floor, miss," chirped the floor-walker.

American tourists tell a story of visiting a small wayside restaurant while going through a section of the Balkan region. When being served, the hostess seeing that the spoons on the table did not look clean, licked them off with her tongue.

Nothing Like Being Sure

The fellow who lit a match to see if his wife put the light out.

A railway company is installing a plant for extracting oil from firemen's clothes. This is regarded as an admission that nothing more can be squeezed out of commuters.

Home Training

A late issue of a Lincolnshire rural weekly contains the following item: "The rolling pin throwing contest at the county fair today was won by Mrs. O. L. Norlap, who made a record throw of 67 feet. . . . Mr. O. L. Norlap won the 100-yard dash."

When a judge told a Kuhlidge colored man he had been acquitted of a chicken stealing charge, the colored boy wanted to know if "acquitted" meant he had to bring the chickens back.

(Father)—I'm surprised that you should become infatuated with that girl. Why, you should have been able to read her like a book.

(Son)—Well, you see, dad, the light was rather low.

A Philosopher Said:

The most wasted of all days is that on which one has not laughed.

(Girl)—Say, Grandma, what does all this excitement mean about the Einstein stuff newspapers have been printing lately?

(Grandma)—I don't know for sure, dear, but I'm going to buy three bottles of it anyhow.

It's the little things that bother us. You can sit on a mountain but not on a tack.

Speaking of debts, how much did Rome-o?
For what Juli-et, of course!

Old Tut Amen wasn't such a bad scout, all things considered. When the secret chambers of his tomb were opened, not a single Pullman car towel or a Waldorf spoon was found among the relics buried with him.

There was a young girl named O'Brien,
Who sang Sunday-school hymns to a lion;
Of this lady there's some
In the lion's tum-tum,
And the rest is an angel in Zion.

Well, if the styles continue as they are, we're not in any danger now of petticoat government.

It's True, Darn It All!

I've eaten my bran and my roughage,
  I've taken my quota of greens;
O forty, my lad, is a tough age
  And harder by far than the 'teens.

I've covered my usual yardage,
  A mile, in the open, a day;
Ah! Forty indeed is a hard age
  Whatever philosophers say.

There's nothing for me in the adage
  That "a man is as old as he feels,"
For any age, boy, is a bad age
  When a fellow can't relish his meals!

FUTURE EVENTS

THE TEXAS STATE DENTAL SOCIETY will hold its forty-ninth annual convention at Beaumont, Texas, April 16-19, 1929.

A cordial invitation to attend is extended to all ethical dentists who are members of state societies.

For information relative to exhibits, write to Dr. John E. Story, Chairman, Goodhue Building, Beaumont, Texas.

J. G. FIFE, *Sec'y-Treas.*,
Medical Arts Bldg., Dallas, Texas.

THE ALUMNI SOCIETY OF THE PHILADELPHIA DENTAL COLLEGE (Dental Department of Temple University) will hold its annual meeting on Wednesday, April 17, 1929, instead of April 18, as previously announced.

THE WESTCHESTER DENTAL SOCIETY will hold its fifth scientific session of the season on Friday, April 19, 1929, at 8:30 P. M., at the Square Studios.

The clinician will be A. Gueft, D.D.S., of New York, whose subject will be *Movable-Removable Bridgework with Special Reference to the Bucco-Lingual Attachment.* The lecture will be illustrated with specially prepared lantern slides.

Preceding the session the lecturer will be entertained at dinner at Francfort's.

All interested practitioners are invited.

THE CONNECTICUT STATE DENTAL ASSOCIATION will hold its sixty-fifth annual convention at Waterbury, Conn., April 30 and May 1-2, 1929.

THE VIRGINIA STATE DENTAL ASSOCIATION will hold its annual meeting in the Hotel Danville, Danville, Va., April 30-May 2, 1929.

A. M. WASH, D.D.S., *Sec'y-Treas.*,
504 Medical Arts Bldg., Richmond, Va.

THE MASSACHUSETTS STATE DENTAL SOCIETY will hold its annual meeting at Hotel Statler, Boston, Mass., May 6-10, 1929.

WILLIAM H. GILPATRIC, *Secy.*,
358 Commonwealth Ave.,
Boston, Mass.

THE NORTH DAKOTA STATE DENTAL ASSOCIATION will hold its next annual meeting at Grand Forks, N. D., May 14-16, 1929.

L. I. GILBERT, D.D.S., *Secretary*,
Fargo, N. D.

THE DENTAL SOCIETY OF THE STATE OF NEW YORK will hold its sixty-first annual meeting in Rochester, N. Y., May 15-17, 1929.

Literary exercises, clinics, exhibits, etc., will be held at the Columbus Building. Dr. E. G. Link, Cutler Bldg., Rochester, N. Y., is chairman of the Exhibits Committee. Dr. John T. McIntee, Cutler Bldg., Rochester, N. Y., is chairman of the Clinic Committee.

The Executive Council will convene for the transaction of the business of the Society on Tuesday, May 14, at 3:00 P. M.

ESSAYISTS:

Frederick B. Noyes, Chicago, Ill.
Chalmer J. Lyons, Ann Arbor, Mich.
O. G. L. Lewis, Philadelphia, Pa.
P. C. Lowery, Detroit, Mich.
T. W. Maves, Cleveland, Ohio.
James K. Burgess, New York, N. Y.

During the time of the meeting sessions of the New York State Dental Hygienists Association and the Dental Assistants Association of the State of New York will be held.

Headquarters will be at Hotel Seneca, and reservations should be made direct with the hotel management.

For information with reference to the literary exercises, clinics, etc., apply to

A. P. BURKHART, *Secy.*,
57 East Genesee St.,
Auburn, N. Y.

THE DENTAL SOCIETY OF THE STATE OF NEW YORK will hold its sixty-first annual meeting at Rochester, N. Y., on May 15-17, 1929.

A cordial invitation is extended to all ethical dentists who are members of state societies to attend. The Society will be pleased to extend a cordial welcome to all ethical Canadian dentists also.

For information with reference to the exhibits, write to E. G. Link, 226 Cutler Bldg., Rochester,

N. Y.; clinics, John T. McIntee, Chairman, Cutler Bldg., Rochester, N. Y.; literary exercises, etc., A. P. Burkhart, Secretary, 57 East Genesee St., Auburn, N. Y.

THE DENTAL ASSISTANTS ASSOCIATION OF THE STATE OF NEW YORK will hold its first annual meeting at Rochester, N. Y., May 16-17, 1929.

A cordial invitation is extended to dentists, dental hygienists and dental assistants to attend the sessions and clinics.

ZOA H. DICKHAUT, *General Secretary,*
344 Woolworth Building,
Watertown, N. Y.

THE ONTARIO DENTAL ASSOCIATION will hold its Sixty-Second Convention at the King Edward Hotel, Toronto, May 27-30, 1929. Members of the American Dental Association and States societies are cordially invited as guests.

FREDERICK J. CONBOY, *Sec'y-Treas.,*
East Block, Parliament Bldg.,
Toronto, Ontario.

THE IOWA STATE BOARD OF DENTAL EXAMINERS will meet at the State University of Iowa College of Dentistry, Iowa City, Iowa, May 27-30, 1929, at 9:00 A. M., for the purpose of examining applicants for license to practice dentistry in Iowa. An examination for dental hygienists also will be given. All papers and credentials must be filed with the Department at least fifteen days prior to date of examination.

For further information and application blanks, address the State Department of Health, Capitol Building, Des Moines, Iowa.

THE NORTHEASTERN MASSACHUSETTS DENTAL SOCIETY will again convene at the New Ocean House, Swampscott, Mass., June 10-12, 1929.

For further particulars, address

HENRY I. YALE, *Secy.,*
Peabody, Mass.

THE MASSACHUSETTS BOARD OF DENTAL EXAMINERS will hold an examination for registration for both dentists and oral hygienists in the City of Boston, Mass., June 11-15, 1929.

All applications must be filed at the office of the Secretary at least ten days before date set for examination.

Full information, application blanks, etc., may be secured at the office of the Secretary, Room 146, State House, Boston.

THE INDIANA STATE BOARD OF DENTAL EXAMINERS will meet in the House of Representatives Room, State House, Indianapolis, Ind., at 8:00 A. M., June 17, 1929, for the purpose of examining all applicants with proper credentials. All applications should be in the hands of the Secretary one week before the meeting.

For applications, clinical requirements and other information, address

J. M. HALE, *Secy.-Treas.,*
Mount Vernon, Ind.

THE MINNESOTA STATE BOARD OF DENTAL EXAMINERS will hold its next meeting on June 18, 1929, at the College of Dentistry, University of Minnesota, Minneapolis. Application blanks may be obtained from the Secretary and must be filed with him not later than June 10th.

F. E. COBB, *Sec'y.,*
601 Donaldson Bldg., Minneapolis, Minn.

THE MAINE DENTAL SOCIETY will hold its annual meeting at the Poland Spring House, South Poland, Me., June 20-22, 1929.

W. F. FOGG, *Secy.,*
168 Main St.,
Yarmouth, Me.

THE CONNECTICUT DENTAL COMMISSION will meet at Hartford, Conn., June 27-29, 1929, to examine applicants for license to practice dentistry and dental hygiene and to transact any other business proper to come before them.

For further information, apply to

ARTHUR B. HOLMES, *Recorder,*
80 Central Ave., Waterbury, Conn.

The fourth annual summer session of POST-GRADUATE STUDY FOR DENTAL HYGIENISTS will open at State Teachers College, Buffalo, N. Y., on July 8, 1929, and will continue through August 16th. While this course is designed primarily for those wishing to qualify as a Dental Hygiene Teacher in the State of New York, the work presented should prove of value to any dental hygienist in her contact with the public.

A parallel course for school nurses will be given also. These courses have been approved by the State Education Department as meeting the requirements for certification as a Dental Hygiene Teacher and School Nurse Teacher.

Tuition is free to residents of New York State, and a nominal charge is made to non-residents. Living expenses approximate from

$10.00 to $15.00 per week. Classes are held five days a week.

Complete announcement of the courses and applications for admission will be sent on request by

DR. S. R. MEAKER, *Supervisor of Oral Hygiene,*
State Education Department, Albany, N. Y.

THE PACIFIC COAST DENTAL CONFERENCE, consisting of British Columbia, Washington, Oregon, Idaho, Utah, Nevada, Southern California and California State Associations, will hold its second triennial meeting in San Francisco, Cal., July 8-12, 1929. All members of the American Dental Association are cordially invited.

Further information may be had from

F. T. WEST, *Secretary,*
2180 Washington St., San Francisco, Cal.

THE AMERICAN SOCIETY OF ORTHODONTISTS will hold its annual meeting in Estes Park, Colorado, July 15-19, 1929. All ethical dentists are invited. A registration fee will be charged to non-members.

Hotels are Stanley (headquarters), The Crags, Lewiston and Elkhorn Lodge. For hotel information, write to Dr. Fred W. Beesley, Republic Bldg., Denver, Colo. Regarding transportation, write to Dr. Kirman E. Taylor, Mack Bldg., Denver, Colo.

ALBERT H. KETCHAM, D.D.S., *President,*
1232 Republic Bldg., Denver, Colo.
CHARLES R. BAKER, D.D.S., *Secretary,*
708 Church St., Evanston, Ill.

THE ARIZONA BOARD OF DENTAL ENGINEERS will hold its next meeting at Flagstaff, Arizona, beginning July 29, 1929.

For further information and application blanks, address

EUGENE MCGUIRE, *Secretary,*
420 Security Building,
Phoenix, Arizona.

The position of DENTAL INTERN at the LENOX HILL HOSPITAL will be vacant September 1, 1929. The term of service is one yeat, with full maintenance. Apply in writing, not later than April 15, 1929, to

GEORGE F. SAUER, *Superintendent,*
112 East 77th St., New York, N. Y.